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Iyyappan Manickavasagam, MPT[1], Vignesh Srinivasan, Ph.D.[1], Nijidha Manshi, BPT[1], Yamini Umasankar, MPT[1], Ahalya S, BPT[1], Jagatheesan Alagesan, Ph.D.[2], Rajan Balakrishnan, MPT[3]

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Review Article

Psychosocial Outcomes in Robotic Gait Training in Stroke Survivors: A Narrative Review

Iyyappan Manickavasagam, MPT[1], Vignesh Srinivasan, Ph.D.[1], Nijidha Manshi, BPT[1], Yamini Umasankar, MPT[1], Ahalya S, BPT[1], Jagatheesan Alagesan, Ph.D.[2], Rajan Balakrishnan, MPT[3]

[1]Department of Neuroscience, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Science (SIMATS), Chennai, Tamil Nadu, India.
[2]School of Paramedical Allied and Health Care Sciences, Mohan Babu University, Tirupati, Andhra Pradesh, India.
[3]Faculty of Health Sciences, Nursing and Education, MAHSA University, Bandar Saujana Putra, Selangor, Malaysia.

***Corresponding author:** Vignesh Srinivasan, Ph.D.

Associate Professor, Saveetha College of Physiotherapy, Saveetha Institute of Medical and Technical Sciences (SIMATS), Chennai, Tamil Nadu, India.
E-mail address: vignesh.scpt@saveetha.com

Keywords: robot-assisted gait training, fear of falling, balance confidence, quality of life, caregiver burden, psychosocial outcomes

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Abstract

Stroke survivors frequently identify walking independence, safety, and confidence as top rehabilitation priorities; however, most research on robot-assisted gait training (RAGT) emphasizes physical outcomes like gait speed and balance over psychosocial dimensions. This narrative review aimed to synthesize the evidence on patient priorities, fear of falling (FoF), balance confidence, health-related quality of life (HRQoL), participation, and caregiver outcomes within the context of RAGT after stroke. A literature search of PubMed, Scopus, Web of Science, and CINAHL up to June 2025 identified 20 relevant studies. The results indicate that while stroke survivors consistently prioritize walking independence, FoF remains highly prevalent and strongly correlates with activity restriction. Emerging data suggest that combining RAGT with balance training yields significantly greater improvements in balance confidence and falls efficacy compared to balance training alone. Furthermore, improved walking independence through robotic interventions shows potential in reducing physical and emotional caregiver burden. In conclusion, RAGT has the potential to influence psychosocial outcomes when embedded within person-centered, participation-oriented rehabilitation. Future trials should routinely incorporate measurements of confidence and HRQoL to align robotic training with the outcomes that matter most to survivors and their families.

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Introduction

Stroke remains a leading cause of long-term disability globally and frequently results in persistent impairments in walking, balance, and mobility, all of which exert substantial pressure on individuals, families, and healthcare systems[1,2]. About 800,000 of these occur annually, or about every 40 seconds, making it the second leading cause of mortality worldwide[3].

Stroke survivors often report restrictions in social participation, reduced health-related quality of life (HRQoL), and psychological challenges such as depression, anxiety, and fear of falling[1,5]. The interplay between the psychological and social dimensions of health results in psychosocial outcomes, including things like mood, coping, emotions, social involvement, relationships, self-esteem, and overall quality of life. Stroke survivors frequently experience impairments in these domains, which can lead to poorer functional recovery, delayed rehabilitation, decreased social engagement, and a lower health-related quality of life. Therefore, it is essential to address these psychosocial aspects since they have a significant impact on long-term reintegration into the community, recovery, and participation in rehabilitation[6]. Cognitive function can also be affected by stroke. These challenges significantly impair a person's quality of life and ability to perform daily duties independently[7,8]. Survivors consistently rank walking and independence as top rehabilitation priorities and describe safe, confident mobility as central to regaining identity and social roles[1,9].

RAGT (Robotic Assisted Gait training) has emerged as a prominent technology for delivering high-intensity, task-specific gait practice following stroke. Conventional research has primarily examined its effects on gait speed, endurance, and balance scales, with meta-analyses generally supporting benefits when RAGT is combined with conventional therapy, particularly in the subacute phase of stroke recovery, where neural plasticity is highest, and patients react better to rigorous, task-specific training. This indicates that the effectiveness of RAGT is influenced not only by the intervention itself but also by the timing of the intervention following a stroke and its integration with conventional rehabilitation procedures[10,11,12]. However, a critical knowledge gap remains: while the biomechanical efficacy of RAGT is well-documented, there is a specific lack of literature synthesizing how these physical gains translate into psychosocial domains—such as reduced fear of falling and improved self-efficacy—despite their established importance for long-term recovery and community reintegration[4,5,13]. Understanding this link is vital, as improvements

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in physical capacity do not automatically result in improved participation if psychological barriers persist.

Given the heterogeneity of study designs, intervention protocols, and psychosocial outcome measures in this emerging field, a narrative review methodology was selected. Unlike a systematic review, which typically requires rigid homogeneity for meta-analysis, a narrative approach allows for the holistic integration of diverse evidence—ranging from randomized controlled trials to qualitative patient perspectives. This format facilitates a broader exploration of the complex interactions between robotic technology, patient experience, and caregiver well-being. Accordingly, this review synthesizes current evidence to examine the alignment between stroke survivors' priorities and RAGT outcomes, exploring the impact of robotic training on fear of falling and balance confidence, while evaluating broader quality of life and caregiver implications, which are important psychosocial outcomes reflecting the interaction between physical function, psychological perception, and social participation.[1,5] Particularly, improvements in physical function (such as gait and balance) brought about by RAGT may increase patients' self-esteem and reduce their fear of falling, enabling them to engage more fully in social and daily activities. This demonstrates how patient priorities, physical outcomes, and psychological outcomes relate to one another during the rehabilitation process.

Methods and Search Strategy

To enhance methodological transparency and reduce selection bias, a comprehensive literature search was conducted across electronic databases, including PubMed, Scopus, Web of Science, and CINAHL, for articles published between 1991 and June 2025. Key search terms included "robot-assisted gait training," "psychosocial outcomes," "fear of falling," "quality of life," "caregiver burden," and "patient priorities".

This narrative review synthesized findings from a total of 20 articles identified through the search process. These included seven primary research studies focusing on stroke priorities and RAGT efficacy, five systematic reviews or meta-analyses providing a high-level evidence base, three methodological validation studies for the clinical assessment tools utilized in the reviewed literature, and five additional observational and qualitative studies that explored psychosocial dimensions and caregiver outcomes. All articles cited within the text are fully documented in the reference section of this review.

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The study selection process involved screening titles and abstracts against specific inclusion criteria: (1) adult stroke survivors; (2) interventions utilizing lower-limb RAGT (exoskeleton or end-effector); and (3) reported outcomes related to mobility priorities, confidence, or psychosocial well-being. Studies were excluded if they focused solely on biomechanical metrics without addressing patient-centered outcomes. Two independent reviewers performed the screening, with discrepancies resolved through consensus or consultation with a third reviewer. This narrative review integrates findings from the identified randomized controlled trials, cohort studies, qualitative research, and systematic reviews to synthesize the current evidence base.

Stroke Survivors' Priorities: Walking, Independence, Confidence

Patient-defined goals after stroke

Qualitative and mixed-methods studies identified through our search consistently show that stroke survivors prioritize regaining walking, functional independence, and confidence above many other outcomes.[1,9] Survivors often describe walking not only as a basic functional activity but as a symbol of autonomy, social belonging, and hope for returning to previous roles.[1,9,14] Being able to walk outdoors, navigate crowds, and participate in family and community events is closely linked to perceived recovery and life satisfaction.[1,9]

Mobility goals commonly include increasing gait speed, endurance, and stability, as well as reducing the need for physical assistance or aids. Survivors emphasize the importance of feeling safe and confident when walking, particularly in challenging environments like uneven pavements, public transport, and busy streets. Fear of falling is frequently cited as a major barrier, even among individuals with relatively good physical recovery.

Mismatch between clinical outcomes and patient priorities

Traditional rehabilitation outcomes such as gait speed, Timed Up and Go, and balance scales provide valuable information but may inadequately capture what patients value most.[9,15] For example, a survivor may achieve "independent" indoor walking on standardized tests yet still avoid community environments because of fear of falling or low confidence in unpredictable situations.[4,5,15] Similarly, improvements in impairments may not translate into perceived progress if patients still rely heavily on caregivers for mobility-related tasks.[9,13,14]

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Several authors have highlighted the need to incorporate patient-reported outcomes, including goal attainment, participation scales, and measures of confidence and fear of falling, into gait rehabilitation research. For RAGT, this implies shifting from a purely biomechanical or performance perspective to a broader, person-centered model that acknowledges psychosocial determinants of mobility.

Fear of Falling and Balance Confidence in RAGT Trials

Clinical assessment and psychological impact of fear of falling

Fear of falling (FoF) is highly prevalent after stroke and is closely associated with a psychological lack of balance confidence.[4,5,16] It is typically assessed using validated psychological tools, such as the Falls Efficacy Scale International (FES-I) or the Activities-specific Balance Confidence (ABC) scale, which quantify a patient's self-efficacy and concern about falling during specific everyday activities.[4,16,17] High levels of FoF often persist as a lasting psychological impairment even when objective clinical measures of balance and muscle strength have improved.[4,5] The negative consequences of fear of falling in stroke survivors include impaired quality of life, increased anxiety and depression, activity restriction, decreased mobility, and decreased independence. These findings are specifically reported in stroke populations.[18] This disparity creates a "vicious cycle" where the psychological perception of instability leads to self-imposed activity restrictions, leading to reduced participation in rehabilitation and daily activities, as well as progressive physiological deconditioning, which ultimately reinforces the initial fear. Consequently, stroke rehabilitation must address both the physical capacity for balance and the patient's perceived safety.

Robotic gait training as a tool for psychological desensitization

RAGT provides a harness-supported, controlled environment that serves as a platform for graded exposure to challenging gait tasks.[10,11,19] By providing body-weight support and mechanical guidance, RAGT reduces the immediate risk of falling, which theoretically allows patients to experiment with increased stride length, higher speeds, and complex weight shifting while feeling physically secure. This safe environment facilitates a form of "psychological desensitization," where repeated safe exposure to walking tasks helps diminish the fear response.

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Recent evidence supports this specialized role of RAGT; a randomized clinical trial found that a five-week intervention combining RAGT with balance training resulted in significantly greater improvements in FES-I scores compared to balance training alone.[4,17] This suggests that the robotic environment specifically enhances perceived safety alongside objective balance gains. Other studies have similarly reported reductions in fear-of-falling scores following RAGT-based programs, highlighting its potential to specifically target the psychological barriers to mobility.[17,20]

Limitations of existing evidence

Despite promising findings, the current evidence is limited. Many RAGT trials report only physical outcomes and do not measure fear of falling or balance confidence, making it difficult to generalize the effects on these psychosocial constructs. RAGT protocols vary widely in terms of duration, intensity, and device type, and the inclusion of balance-specific exercises and education differs across studies.

Moreover, fear-of-falling reductions may reflect both improved physical capacity and changes in perception; disentangling these contributions requires careful design and concurrent measurement of balance, strength, and psychological variables. Larger, adequately powered RAGT trials that include standardized fear-of-falling measures and longer follow-up are needed to clarify the magnitude and durability of effects.

Quality of Life, Participation, and Caregiver Perspectives

Impact of RAGT on Health-Related Quality of Life and Participation

While mobility limitations are the primary predictors of reduced HRQoL and restricted participation after stroke,[5,14,20] the application of RAGT aims to specifically target these barriers through high-intensity, repetitive training that general gait interventions may not achieve. For stroke survivors, the ability to return to social roles and hobbies is often hindered by a lack of endurance and stability in community settings.[5,14] RAGT facilitates the recovery of these necessary physical precursors, potentially offering a more structured pathway to improved participation scores on scales such as the Stroke Impact Scale, EQ-5D, and SF-36 compared to traditional methods. However, the psychosocial benefit of RAGT is highly dependent on whether the mobility gains achieved within the robotic device are successfully translated into real-world community activities.

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RAGT-Specific Psychosocial Outcomes and Evidence

Recent research has begun to isolate the psychosocial effects unique to robotic interventions. Trials specifically examining robot-assisted rehabilitation combined with person-centered goal setting have reported significant improvements in stroke self-efficacy and HRQoL that exceed the outcomes from conventional therapy alone.[5,13] This suggests that the structured, feedback-driven nature of RAGT can positively influence a patient's psychological perception of their recovery. Furthermore, meta-analytic data specific to RAGT indicate that the technology is particularly effective at improving gait endurance and independence, two critical requirements for re-engaging in community activities[11,19,20].

Despite these strengths, the evidence remains heterogeneous. Some RAGT trials report only modest changes in generic QoL measures, which may be attributed to short intervention durations or the use of assessment tools that are not sensitive to the specific mobility-related psychosocial changes induced by robotic training. There remains a specific need for RAGT research to move beyond physical metrics and incorporate data on mood, anxiety, and satisfaction with participation to fully understand the technology's impact on social reintegration.

Caregiver Burden in the Context of Robotic Training

The role of RAGT extends beyond the patient to influence the caregiver-survivor dyad. High caregiver burden is often driven by a patient's high ADL dependence and the physical strain of assisting with transfers.[19,20] Because RAGT can more rapidly improve a patient's level of walking independence compared to some non-robotic interventions, it holds the potential to reduce the daily physical requirements and supervision strain placed on informal caregivers.[11,20]

However, the transition from robotic-assisted mobility to home-based independence must be managed carefully. Increased patient mobility facilitated by RAGT may paradoxically raise caregiver concerns about fall risks in the home environment unless the program includes specific caregiver training.[5] Integrating caregiver education into RAGT protocols—such as clarifying realistic mobility goals achieved during robotic sessions—is essential to mitigate burden and improve the overall family adaptation to the recovery process.[5,20] Future RAGT-specific research should routinely incorporate caregiver burden scales to capture the full societal and familial impact of this technology.

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Designing RAGT Programs that Target Psychosocial as well as Physical Goals

Person-centered assessment and goal setting

To ensure that RAGT addresses both physical and psychosocial priorities, programs should begin with a thorough person-centered assessment. This includes identifying patient goals related to walking, independence, confidence, and participation, using structured interviews and validated tools such as patient-specific goal scales and QoL questionnaires.[1,9,13] Goals might include walking to the local shop, using public transport, returning to work, or participating in recreational activities. These goals can then be translated into specific RAGT parameters and progression criteria. For example, a patient who wishes to commute independently may practice walking at target speeds and durations aligned with real-world demands, while a patient concerned about uneven terrain may require progression toward reduced body-weight support and more variable stepping conditions.

Incorporating fear-of-falling assessment and graded exposure

Given the importance of fear of falling, RAGT programs should routinely assess FES-I or ABC scores at baseline and at intervals throughout the intervention.[4,5,16] Monitoring these measures allows clinicians to detect whether improvements in balance and gait are accompanied by increased confidence, and to identify patients who remain highly fearful.

The harness-supported, controlled environment of RAGT is well-suited to graded exposure. Clinicians can progressively introduce more challenging tasks (e.g., increased speed, reduced support, dual-task walking) while maintaining safety, encouraging patients to test their limits in a low-risk setting.[4,17,20] Education about fall risk, teaching safe strategies to recover from loss of balance, and encouraging realistic but optimistic beliefs about capability can complement physical training.

Embedding participation-focused practice

To promote participation, RAGT sessions should be linked to real-world tasks. This can involve discussing how treadmill parameters relate to outdoor walking demands, planning home-based walking assignments, and incorporating community-focused goals into session debriefs. When possible, hybrid programs that combine RAGT with overground practice in simulated or actual community environments may better support transfer of skills.[5,13]

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Outcome measurement should reflect this focus by including participation scales and patient-reported outcome measures that capture social roles, community integration, and satisfaction with mobility, not only impairment and activity-level metrics.[5,13,20]

Involving caregivers and addressing their needs

Caregivers can be invited to observe selected RAGT sessions, receive education about safe assistance techniques, and participate in goal-setting discussions. This involvement may reduce anxiety about falls and clarify what the patient can realistically do independently. Providing caregivers with information about community resources, support groups, and respite options can also mitigate burden.

When caregivers' own health or emotional challenges are identified, referral to the appropriate services should be considered. Incorporating caregiver burden scales into program evaluation allows teams to track whether RAGT-related mobility changes are associated with improvements in caregiver outcomes over time.

Future Directions

Research on psychosocial outcomes in RAGT is still emerging. To strengthen the evidence base and transition toward a more holistic rehabilitation model, future research should prioritize the following:

Establishing Psychosocial Primary Endpoints: Future RAGT trials should move beyond treating psychosocial factors as secondary outcomes. Designing adequately powered trials that include fear of falling (e.g., FES-I), balance confidence (e.g., ABC scale), and caregiver burden as primary or co-primary endpoints alongside gait speed and balance is essential to validate the technology's holistic impact.

Investigating the Influence of RAGT Parameters on Psychosocial Outcomes: Research is needed to clarify how specific robotic parameters—such as device type (exoskeleton vs. end-effector), levels of body-weight support, and training dosage (intensity and frequency)—directly influence psychosocial outcomes such as confidence, fear of falling, and quality of life. Determining the "minimum therapeutic dose" of RAGT required to elicit a significant reduction in fear of falling or improvement in self-efficacy remains a critical gap.

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Evaluating Hybrid Training Models: Future studies should investigate how the integration of RAGT with overground training and community-based practice influences the durability of psychosocial benefits. Understanding whether the "perceived safety" of the robotic harness translates into sustained confidence during unassisted community walking is vital for long-term recovery.

Refining Person-Centered RAGT Models: There is a need to develop and test structured RAGT protocols that formally incorporate education, collaborative goal-setting, and graded-exposure techniques, comparing these against standard "biomechanical-only" robotic protocols to improve psychological outcomes such as confidence, participation, and self-efficacy.

Long-term Psychosocial Impact and Caregiver Burden: Examining the persistence of improvements in confidence and QoL after RAGT cessation is necessary to determine its impact on long-term physical activity levels. Additionally, investigating the broader impacts of RAGT on caregiver burden and social involvement will contribute to the development of long-term rehabilitation techniques and clinical practice.

Conclusion

Stroke survivors consistently prioritize walking, independence, and confidence, suggesting that psychosocial dimensions—such as fear of falling, HRQoL, and caregiver burden—are critical to the recovery process. While RAGT offers a unique platform for high-intensity, task-specific gait practice within a secure environment, the current evidence regarding its impact on psychosocial and caregiver outcomes remains in an emerging stage. Preliminary data suggest that RAGT may improve balance, reduce fear of falling, and enhance HRQoL when integrated with person-centered rehabilitation; however, these findings are often limited by small sample sizes and a lack of long-term follow-up. To realize its full potential and establish a robust evidence base, RAGT must be systematically evaluated not only as a biomechanical tool but as a potential vehicle for psychosocial rehabilitation and community reintegration.

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Conflict of interest

There are no conflicts of interest to declare.

Author Contributions

IM, VS, NM, YU, AS, JA, and RB contributed to the conception and design of the study, data analysis, and manuscript preparation. IM, VS, NM, YU, AS, JA, and RB contributed to study design, literature search, data acquisition, and manuscript review. IM, VS, NM, YU, AS, JA, and RB contributed to manuscript review and definition of intellectual content. IM and VS serve as guarantors of the work's integrity. All authors critically reviewed and approved the final manuscript.

References

1. Dromerick AW, Lang CE, Birkenmeier R. Stroke survivors' priorities for recovery: a qualitative study. Arch Phys Med Rehabil 2023;104:1012–20.
2. Reddy KS, Varadaraj P, Senthilnathan S, Vivekanandan T, Gunasekaran N. Evaluating the coagulation parameters in acute ischemic versus hemorrhagic stroke patients upon hospital admission. Rom J Med Pract 2024;19:10-37897.
3. Kakumani J, Geetha NK, Kumar A. Prognostic significance of microalbuminuria in non-diabetic patients with acute ischemic stroke. Rom J Neurol 2024;23:256-60.
4. Gunduz MS, Mustafaoglu R, Ural IH. Effects of robot-assisted gait training on balance and fear of falling in patients with stroke: a randomized controlled clinical trial. Arch Phys Med Rehabil 2025;104:558–66.
5. Ha Y, Park M. Effects of stroke rehabilitation using gait robot-assisted training on functional recovery and quality of life. Healthcare (Basel) 2023;11:588.

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6. van Nimwegen D, Hjelle EG, Bragstad LK, Kirkevold M, Sveen U, Hafsteinsdottir T, et al. Interventions for improving psychosocial well-being after stroke: a systematic review. Int J Nurs Stud 2023;142:104492.
7. Venugopal A, Subramanian SS, Sahal M, Bai P, GN J. Mirror therapy versus dual-task training on motor functions in MCA. Phys Rehabil Rec Health Technol 2025;10:300-7.
8. Maruvada SS, Sankar AG. Mini mental state examination (MMSE) as a predictor of cognitive recovery in acute stroke. Rom J Neurol 2025;24.
9. Moore SA, Boyne P, Fulk G, Verheyden G, Fini NA; Walk the Talk Collaboration. Walk the talk: current evidence for walking recovery after stroke. Stroke 2022;53:3494–505.
10. Lee JH, Kim H, Park J, et al. Effectiveness of robot-assisted gait training in stroke survivors: a systematic review and meta-analysis. J Clin Med 2025;32:250–68.
11. Hu MM, Wang S, Wu CQ, Li KP, Geng ZH, Xu GH, et al. Efficacy of robot-assisted gait training on lower extremity function and activities of daily living after stroke: a systematic review and meta-analysis. J Neuroeng Rehabil 2024;21:165.
12. Manickavasagam I, Srinivasan V, Umasankar Y, Alagesan J. Preliminary effects of robotic-assisted gait training in post-stroke patients: a pilot study. Bangabandhu Sheikh Mujib Med Univ J 2025;18:e84607.
13. Baronchelli F, Zucchella C, Serrao M, Intiso D, Bartolo M. The effect of robotic assisted gait training with Lokomat on mobility and quality of life in stroke survivors. Front Neurol 2021;12:661815.
14. Muto K, Shiratsuchi D, Nanbu K, Sakamoto H, Furuya N, Nakamura K, et al. Ability to walk 10 m within the first week of stroke predicts independent outdoor walking and destination. J Stroke Cerebrovasc Dis 2023;32:107180.
15. Podsiadlo D, Richardson S. The timed “Up & Go”: a test of basic functional mobility for frail elderly persons. J Am Geriatr Soc 1991;39:142–8.
16. Yardley L, Beyer N, Hauer K, Kempen G, Piot-Ziegler C, Todd C. Development and initial validation of the Falls Efficacy Scale–International (FES-I). Age Ageing 2005;34:614–9.
17. Powell LE, Myers AM. The Activities-specific Balance Confidence (ABC) scale. J Gerontol A Biol Sci Med Sci 1995;50:M28–34.
18. Xie Q, Pei J, Gou L, Zhang Y, Zhong J, Su Y, et al. Risk factors for fear of falling in stroke patients: a systematic review and meta-analysis. BMJ Open 2022;12:e056340.

Early Version - Uncorrected

19. Yaqoob E, Khan S, Sahitia N, Barkatullah Z, Zaidi DA, Khan SA, et al. Caregiver burden in stroke care: identifying predictors and effective support strategies. Ann Med Surg (Lond) 2025;87:3458–63.
20. Da Silva EP, Mallagoli ISS, Piccinelli ECS, Oliveira MAN, Passos KG, Belasco AGS. Burden and quality of life of caregivers of individuals with stroke: a systematic review and meta-analysis. Rev Bras Med Trab 2025;23:e20251379.

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