

J Int Neuromodulation Soc. 2022 Aug;25(6):829-35.
doi: <https://doi.org/10.1111/ner.13374>

39. Ramanathan PV, Salas-Vega S, Shenai MB. Directional Deep Brain Stimulation-A Step in the Right Direction? A Systematic Review of the Clinical and Therapeutic Efficacy of Directional Deep Brain Stimulation in Parkinson Disease. *World Neurosurg.* 2023 Feb;170:54-63.e1. doi: <https://doi.org/10.1016/j.wneu.2022.11.085>

40. Wang S, Zhu G, Shi L, Zhang C, Wu B, Yang A, et al. Closed-Loop Adaptive Deep Brain Stimulation in Parkinson's Disease: Procedures to Achieve It and Future Perspectives. *J Park Dis.* 2023 Jun;13(4):453-71. doi: <https://doi.org/10.3233/JPD-225053>

41. Little S, Brown P. Debugging Adaptive Deep Brain Stimulation for Parkinson's Disease. *Mov Disord Off J Mov Disord Soc.* 2020 Apr;35(4):555-61. doi: <https://doi.org/10.1002/mds.27996>

42. Boutet A, Madhavan R, Elias GJB, Joel SE, Gramer R, Ranjan M, et al. Predicting optimal deep brain stimulation parameters for Parkinson's disease using

functional MRI and machine learning. *Nat Commun.* 2021 Dec;12(1):1-13.

doi: <https://doi.org/10.1038/s41467-021-23311-9>

43. Hacker M, Cannard G, Turchan M, Meystedt J, Davis T, Phibbs F, et al. Early subthalamic nucleus deep brain stimulation in Parkinson's disease reduces long-term medication costs. *Clin Neurol Neurosurg.* 2021 Nov;210:106976.

doi: <https://doi.org/10.1016/j.clineuro.2021.106976>

44. Spindler P, Alzoobi Y, Kühn AA, Faust K, Schneider GH, Vajkoczy P. Deep brain stimulation for Parkinson's disease-related postural abnormalities: a systematic review and meta-analysis. *Neurosurg Rev.* 2022 Oct;45(5):3083-92.

doi: <https://doi.org/10.1007/s10143-022-01830-3>

45. Mahlknecht P, Foltynie T, Limousin P, Poewe W. How Does Deep Brain Stimulation Change the Course of Parkinson's Disease? *Mov Disord Off J Mov Disord Soc.* 2022 Aug;37(8):1581-92.

doi: <https://doi.org/10.1002/mds.29052>

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EFFECTIVE STRATEGIES FOR COORDINATED REHABILITATION

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Ключові слова: *координована реабілітація, інсульт, міжпрофесійна співпраця, відновлення пацієнтів, якість життя, стратегія реабілітації*

Abstract. Effective strategies for coordinated rehabilitation. Shuranova L., Vacková J., Rimárová K., Hryshchuk A. Rehabilitation of stroke patients is a complex process that requires coordination between healthcare professionals, patients and their families. This study aims to develop strategies to optimize coordinated care and rehabilitation in order to improve patients' quality of life and facilitate their return to normal life. The main objective is to examine the implementation of coordinated care and rehabilitation before, during and after hospital discharge. The study was conducted within the framework of the project GAJU 066/2022/S, approved by the Ethics Commission (number 6/2022). A qualitative approach was used, with semi-structured interviews with healthcare professionals involved in the rehabilitation of patients after stroke as the main method of data collection. The study involved 143 professionals from different hospitals, including doctors, physiotherapists, occupational therapists, psychologists, social workers and nurses. The data were analysed using ATLAS.ti software and different coding strategies. Based on the information obtained, a SWOT analysis was conducted, the results of which were used to propose process optimization. It helped to identify key strengths, weaknesses, opportunities and threats to coordinated rehabilitation. The results indicate the need to improve cooperation between professionals and increase the availability of coordinated rehabilitation services. Key challenges include insufficient support and awareness of patients and their families, limited access to home-based rehabilitation services, and insufficient coordination between health and social service providers. Recommended strategies include improving interprofessional communication, expanding access to home-based services, increasing financial support, improving education of patients and their families, and introducing a system for monitoring the quality of services provided.

Реферат. Ефективні стратегії для координованої реабілітації. Шуранова Л., Вацкова Й., Рімарова К., Грищук А. Реабілітація пацієнтів, які перенесли інсульт, є складним процесом, що вимагає координації між медичними працівниками, пацієнтами та їхніми родинами. Це дослідження спрямоване на розроблення стратегій для оптимізації координованої допомоги та реабілітації з метою покращення якості життя пацієнтів та полегшення їхнього повернення до нормального життя. Основна мета полягає у вивченні впровадження координованого догляду та реабілітації до, під час та після виписки з лікарні. Дослідження проведено в рамках проєкту GAJU 066/2022/S, затвердженого етичною комісією (номер 6/2022). Використано якісний підхід, основним методом збору даних були напівструктуровані інтерв'ю з медичними працівниками, які займаються реабілітацією пацієнтів після інсульту. У дослідженні взяли участь 143 фахівці з різних лікарень, включаючи лікарів, фізіотерапевтів, ерготерапевтів, психологів, соціальних працівників та медсестер. Дані було проаналізовано за допомогою програмного забезпечення ATLAS.ti з використанням різних стратегій кодування. На основі отриманої інформації проведено SWOT-аналіз, результати якого використано для пропозицій щодо оптимізації процесу. Цей аналіз дозволив визначити ключові сильні та слабкі сторони, можливості та загрози для координованої реабілітації. Результати вказують на необхідність покращення співпраці між професіоналами та збільшення доступності координованих реабілітаційних послуг. Основні проблеми включають недостатню підтримку та обізнаність пацієнтів і їхніх родин, обмежений доступ до домашніх реабілітаційних послуг і недостатню координацію між постачальниками медичних та соціальних послуг. Рекомендовані стратегії передбачають покращення міжпрофесійної комунікації, розширення доступу до домашніх послуг, збільшення фінансової підтримки, підвищення рівня освіти пацієнтів та їхніх родин, а також запровадження системи моніторингу якості наданих послуг.

Cerebrovascular disease (CVA/stroke) represents a significant and growing global health challenge [2]. It is the leading cause of acquired physical disability in adults and the second leading cause of death in middle – and high-income countries [2]. Acute CVA is often referred to as a stroke, and it is essential to understand that this is not a random occurrence [3]. ‘Time is brain’ emphasizes the critical importance of rapid assessment and treatment of acute CVP [3]. CVA, a major contributor to disability and mortality across the globe, affects people of all backgrounds and significantly impacts families, communities, and healthcare systems everywhere [4].

Traditionally, CVA has been described as a neurological deficit caused by acute focal damage to the central nervous system due to vascular causes such as cerebral infarction, intracerebral hemorrhage, and subarachnoid hemorrhage [5].

According to the 2021 Guidelines of the Czech Ministry of Health, CVA is a sudden brain disease

caused by a vascular blood supply disorder. Approximately 90% of cases are ischemic strokes caused by blockage of a cerebral artery, less commonly bleeding from smaller penetrating arteries (about 8%) or aneurysms of larger cerebral arteries (1.5%) [6].

The prognosis of this disease is always uncertain and depends on the extent of brain tissue damage. About 40% of patients after CVA die within the first year [7]. Sacco et al. [5] emphasize that this disease is the leading cause of disability and death worldwide.

Over the past decade, there has been an increase in the overall incidence of ischemic and hemorrhagic strokes to 85-94 cases per 100,000 population, with a markedly higher rate (1151-1216 cases per 100,000) among people over 75 years of age [2]. Around 85% of all stroke-related deaths occur in low-income countries, which also account for 87% of stroke-related disability years [2].

In 2019, the WHO estimated that stroke was the second most common cause of death, with a total of

6.7 million deaths, accounting for 11.9% of all deaths worldwide [8]. These data demonstrate the global importance of the problem and the need to improve health systems to meet the growing needs of an aging population [9].

Thus, research and improvement of treatment and rehabilitation methods for patients with CVA are extremely relevant, as they will help reduce mortality and disability, improve patients' quality of life, and increase the effectiveness of medical care.

Implementing research into practice in stroke rehabilitation is a complex process that requires effective strategies [10]. According to Vacková et al. [11], coordinated rehabilitation refers to interprofessional collaboration at home after the patient/client is discharged. The authors state that this coordination is similar to the concept of Community-Based Rehabilitation (CBR). It is essential to identify and use strategies that improve the adoption of evidence-based practice among patients and maximize their functionality [10]. The authors emphasized that collaboration with implementation experts is critical to achieving success. Relevant economic analysis is also lacking, particularly comparing treatment costs with and without monitoring.

Given that most stroke patients spend a significant portion of their lives outside formal healthcare settings, it is essential to expand and coordinate partnerships with government sectors, such as the Ministry of Labor and Social Policy, the private health sector, NGOs, and community groups [12]. To address this, stroke care involves a comprehensive range of services from prevention and acute treatment to rehabilitation and long-term support, emphasizing the need for effective systems to ensure optimal patient outcomes [13].

This study investigated how coordinated care, and rehabilitation can be implemented before, during, and after a patient is discharged from the hospital after a stroke. It examined the components of coordinated rehabilitation, i.e., the patient/client, their family, and treatment professionals. This article mainly focuses on the design of strategies recommended to optimize coordinated rehabilitation (COR). This study was conducted as part of the GAJU project 066/2022/S, approved by the Ethics Committee under number 6/2022.

MATERIALS AND METHODS OF RESEARCH

This study used a qualitative research approach, focusing on the experiences of treatment professionals caring for patients after stroke. The primary method of data collection was semi-structured interviews with treatment professionals.

The study was conducted within the framework of the GAJU 066/2022/S project, with participation

from two hospitals, referred to as Hospital A and Hospital B. The expert group included the following specialists:

- Physicians of rehabilitation medicine: 7
- Social workers: 2
- Psychologists: 2
- Occupational therapists: 4
- Physiotherapists: 21
- Nursing staff: 17

In addition, the study included 89 General Practitioners (GPs), who were divided into two groups:

- GPs caring for patients directly involved in the study: 7
- GPs caring for other post-stroke patients: 82

A total of 32 patients who had experienced a stroke between 2021 and 2023 participated in the study. However, 7 patients withdrew from the study, leaving 25 patients in the follow-up phase.

Other participants included family members and caregivers who played a crucial role in the rehabilitation process and in helping patients adapt to their home environment. This group consisted of 20 caregivers.

All participants were thoroughly informed about the aims and focus of the study before it began. The research was conducted following the ethical principles outlined in the WMA Declaration of Helsinki – "Ethical Principles for Medical Research Involving Human Subjects" and the "Universal Declaration on Bioethics and Human Rights" by UNESCO. To maintain confidentiality and anonymity, all interviews were coded.

The semi-structured interviews were designed to gather two types of information: (a) details about the caregivers (e.g., their relationship with the patient, their role in care) and (b) their experiences and perceptions related to the use of coordinated rehabilitation services. The interview framework allowed for guided conversations, with flexibility for participants to freely share their experiences and perspectives [13].

A qualitative approach was utilized to explore participants' behaviors, feelings, and experiences related to key issues or phenomena [15]. The interviews were transcribed verbatim and anonymized by replacing all identifiable information with pseudonyms. The qualitative data obtained through the interviews were analyzed using ATLAS.ti software (license L-64C-A19) [1]. This analysis incorporated all types of coding – open, axial, and selective – where the depth of the interviews allowed for such analysis. The analysis was considered complete when the coding sufficiently converged, and the coders agreed that the themes adequately represented the key issues of the study. The qualitative nature of the research meant that the concepts were not operationalized [16]. The

study conforms to the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist [17]. The results of the data analysis were synthesized into a SWOT analysis [18], a strategic tool used to identify and evaluate strengths, weaknesses, opportunities, and threats. This approach facilitates a comprehensive assessment of the internal and external factors impacting an organization or project, aiding in the development of effective strategies and decision-making processes.

RESULTS AND DISCUSSION

Discharging patients after stroke and assisting them in returning to normal life is a significant challenge involving many aspects. Effective strategies to improve collaboration between professionals and increase the availability of COR services for patients after CVA are essential. This way, we can ensure that all patients receive quality and comprehensive care or interventions crucial for their successful return to normal life.

The main problem faced by caregivers is the extreme difficulty of the situation. Although positive factors such as family support, familiar home surroundings, and hobbies can help significantly, there is often still a lack of sufficient support and awareness of available services and rehabilitation programs. Another major problem is the lack of awareness of rehabilitation, exercise, and services available after discharge from the hospital. This lack leads to a feeling of little support for both patients and their caregivers and highlights the need for improvement in the way information and services are provided. Collaboration with GPs is rated differently but is often perceived by clients/patients as inadequate.

The testimonies of rehabilitation practitioners show that rehabilitation's success depends on close cooperation between different health and social professions, including physiotherapists, occupational therapists, speech and language therapists, and social workers or healthcare and social workers. This interprofessional cooperation enables developing and implementing a comprehensive rehabilitation plan tailored to each patient's needs.

Although the importance of coordinated rehabilitation is evident, it is not fully implemented. One of the main obstacles is the lack of accessibility to home rehabilitation and the minimum information about the available services and programs provided to patients and their families. This can lead to delayed or inadequate care, negatively affecting treatment outcomes.

Another critical factor highlighted is the role of the patient's family and social environment. Family members' active support and involvement are essential for rehabilitation success, as they provide the patient with the motivation and support needed to

achieve the best possible outcome. Rehabilitation physicians stress the importance of sufficient information and training for family members to support recovering individuals effectively.

The psychological reactions of patients after stroke and their impact on the recovery process are crucial, and early and comprehensive involvement of psychologists in the rehabilitation team can contribute significantly to their better adaptation to changed life circumstances. Psychologists, as well as rehabilitation physicians, physiotherapists, and other professionals, must work closely together to ensure that the patient has access to holistic care.

Psychologists point to challenges in coordinated rehabilitation, including the limited availability of services for patients after hospital discharge, particularly if they need continued psychotherapy or cognitive rehabilitation in a home setting. Psychologists, therefore, stress the need to develop a system that would allow better access to psychological support and cognitive rehabilitation.

Occupational therapists' testimony stresses close collaboration with an interprofessional team that includes physiotherapists, speech therapists, doctors, and nurses. This collaboration is crucial not only for coordinating rehabilitation interventions but also for an overall assessment of clinical outcomes and the planning of future care.

One of the main challenges in the context of coordinated rehabilitation is to ensure sufficient availability of occupational therapy services for patients after discharge from the hospital. Informants highlight patients' challenges, such as decreased self-sufficiency, mobility impairments, and decreased perceptual and cognitive function. Occupational therapists are key to addressing these needs through education about compensatory aids, home environment modification, and self-therapy continuation to enable patients to recover and reintegrate into society.

Another important aspect is working with patients' families. Education and family involvement in the rehabilitation process are essential for success and can significantly improve patients' quality of life. Occupational therapists stress the need to provide referrals and advice to families to promote continuity of care and rehabilitation at home.

One of the main challenges physiotherapists identified is the lack of advanced rehabilitation services after hospital discharge and care coordination that would include continuity of rehabilitation measures in the patient's home environment. This highlights the need for greater access to aftercare and support for patients and their families.

Another important aspect highlighted by physiotherapists is the role of family and carers in

rehabilitation. Physiotherapists stress the importance of educating families and carers so that they can provide adequate support and be active partners in the rehabilitation process.

The statements revealed that nurses consider the improvement of the patient's condition, the cooperation of the interprofessional team, and the availability of equipment and aids to be positive aspects of the care provided. On the other hand, the main negative aspects include a lack of staff and time, which leads to additional work pressure and time pressure, as well as uncooperative patient families that can affect the quality of care provided. Nurses also stress the importance of collaboration with the patient's family, especially regarding information transfer and exercises.

Healthcare and social workers highlight the need to improve planning and implementing rehabilitation services to ensure that clients/patients receive the support and resources they need for their social recovery. Involving families and strengthening their role in patient care is another crucial factor that can contribute significantly to the success of the rehabilitation process.

Although follow-up of patients in the first year after stroke is limited in general practice, general practitioners are indispensable in providing comprehensive care that includes prevention, diagnosis, treatment, and health assessment.

Other important aspects include the need to overcome barriers to patient mobility and ensure continuity of care. Limitations in travel distances and accessibility of services, as well as the lack of coordination between health and social service providers, are challenges that need to be addressed.

Another critical issue is the lack of continuity of rehabilitation services and the need for better involvement of families in patient care. Practitioners stress the importance of educating families and patients so that they can provide adequate support and be active partners in the rehabilitation process.

This also implies that interprofessional collaboration and communication between GPs, specialists, and patient's families are crucial to optimizing the overall approach to care management/intervention for patients after stroke.

Patients' experiences suggest that recovery includes physical and psychosocial aspects and emphasizes the importance of continuous and coordinated care.

Patients rated their inpatient rehabilitation experience as primarily positive, reporting that they felt well, were supported by professional staff, and had access to the resources they needed to recover. This finding underscores the importance of effective

communication and collaboration between different members of the healthcare team and the patient, as well as the need to individualize rehabilitation programs based on the patient's needs and preferences. The family and home environment also play a crucial role in recovery. Patients stressed the need for support from family and friends, as well as the need to access rehabilitation services and aid in the home environment. They also highlighted the importance of the availability of information regarding aftercare and rehabilitation options.

Coordinated rehabilitation after stroke is a complex process in which patients' needs change dynamically and require close collaboration between different health and social service providers. Professionals from different medical disciplines, as well as the patients themselves and their families, play an important role in this process. From the perspective of the interprofessional team, it is evident that coordinated care must be personalized and flexible.

Although the importance of coordinated rehabilitation is evident, there are barriers to overcome. The most important one is the lack of comprehensive rehabilitation services, particularly in the home setting, and the lack of awareness among patients and their caregivers of available resources and programs. This situation highlights the urgent need to improve care systems, provide information and support for patients' families, and ensure continuity of care after discharge from the hospital.

A SWOT analysis was developed to assess the current situation in detail and to identify key strengths, weaknesses, opportunities, and threats in the area of interventions for clients/patients after stroke (Fig. 1). This comprehensive overview allows for a better understanding of the challenges and is essential for planning effective improvements and strategies within a coordinated rehabilitation framework.

Strengths (Fig. 1) include family support, which consists of the active involvement of family members. They provide patients with emotional and practical support, significantly improving their quality of life. There are also well-equipped rehabilitation centers and effective communication and cooperation with professionals. Positive cooperation with rehabilitation nurses and other health professionals who visit patients at home ensures the necessary care.

Another strength is the home environment, which motivates patients' recovery, including activities such as exercise, chores, and hobbies. Some caregivers can actively seek out information and sources of support, such as websites focused on life after stroke, non-profit organizations, and professional literature.

Strong collaboration between different professionals, such as rehabilitation physicians,

physiotherapists, occupational therapists, speech therapists, and other specialists, and effective interdisciplinary communication and coordination are also strengths. Early rehabilitation, in the sense of starting rehabilitation during hospitalization and

then transitioning to outpatient and home rehabilitation after discharge, is also a strength. Providing a wide range of therapies to improve the quality of life and support the patient's overall recovery is also essential to comprehensive care.

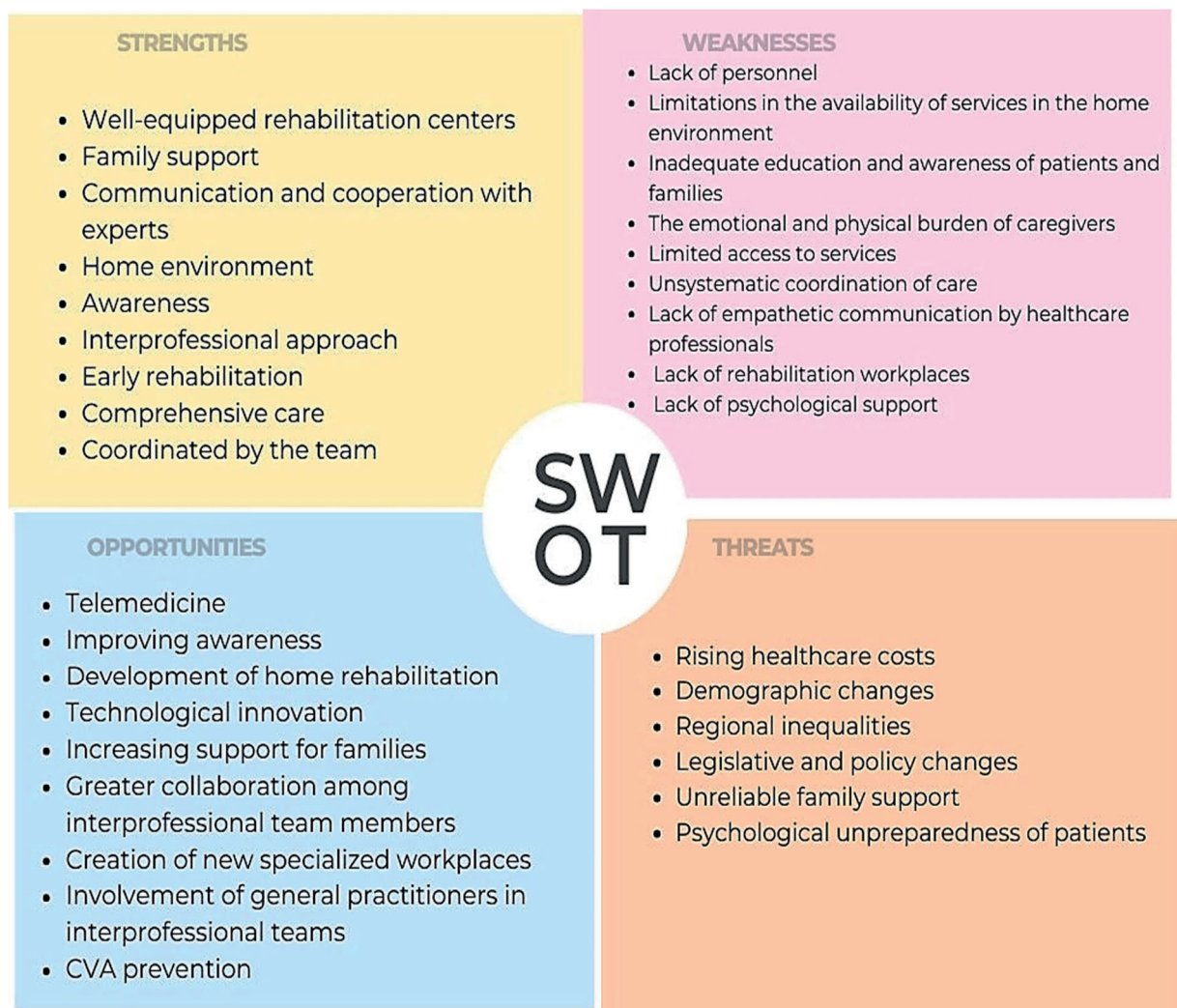


Fig. 1. SWOT analysis

Conversely, the lack of qualified medical staff is one of the main weaknesses (Fig. 1). This problem leads to the overworking of the existing staff, longer waiting times for rehabilitation, and the reduced quality of care provided. Also, a lack of communication with patients and their families about their condition, treatment options, and prognosis can lead to frustration, mistrust, and lower patient engagement in the rehabilitation process.

Another weakness is the limited availability of services in the home setting. Patients after stroke often need long-term rehabilitation that could be effectively completed at home. However, the lack of home care services and mobile rehabilitation

teams makes it difficult for patients to continue therapy outside the hospital setting, which can slow down their recovery. The limited number of rehabilitation facilities leads to longer waiting times for available services and limits patients' options for optimal recovery.

Another significant weakness is inadequate education and information for patients and their families. Without sufficient information about the rehabilitation process, treatment options, and expected outcomes, unrealistic expectations, inadequate engagement in rehabilitation, and reduced motivation to adhere to recommended procedures may result.

The emotional and physical burden on caregivers caring for patients after stroke is also a significant weakness. This burden can lead to burnout, health problems, and a reduced quality of care they can provide. Lack of support and respite for carers exacerbates these problems.

Another weakness is the inconsistency of care coordination between different healthcare providers. Lack of coordination leads to duplicated or missing services, meaning that patients do not receive a comprehensive and continuous rehabilitation plan, which can slow down their progress.

Lack of psychological support for patients after stroke is another weakness. These patients face significant psychological challenges such as depression, anxiety, and reduced motivation. These problems can worsen without adequate psychological care, slowing the rehabilitation and impairing the overall quality of life.

Opportunities (Fig. 1) include telemedicine, which allows access to health care and rehabilitation, especially for those who cannot easily come to health facilities. This allows doctors to provide care remotely and monitor patients from the comfort of their own homes. The development of home-based rehabilitation allows patients to receive expert care and support in the home environment, which can lead to faster recovery and improved quality of life.

Improved awareness and education can be achieved through online platforms and training, raising awareness of care and rehabilitation among patients and healthcare professionals. Increasing family support through training and support groups can improve care for CVA patients and reduce the burden that family members experience in caring for their loved ones.

Greater collaboration between interprofessional team members allows for more efficient and coordinated patient care, which can lead to better treatment outcomes. Creating new specialized units, such as rehabilitation centers and inpatient units, can improve access to specialist care and provide patients with the support they need for rehabilitation.

Involving GPs in interprofessional teams can strengthen the coordination of care and allow better consideration of the needs of patients with stroke in primary care. Preventing CVA is another area where there is an opportunity to improve care and reduce the burden on the healthcare system, which can be achieved through education, screening, and prevention.

Threats (Fig. 1) such as rising healthcare costs, demographic changes, and regional inequalities are linked to legislative and policy changes. Unreliable family support and the psychological unpreparedness of patients further increase the situation's complexity.

The high financial costs of long-term care and rehabilitation can be financially unsustainable for families, exacerbated by inadequate resources and capacity in healthcare facilities. The constant stress on carers caused by high demands can lead to burnout and negatively affect patient care. The risk of social isolation for carers and patients, who may feel a lack of community support, is reinforced by bureaucratic barriers and the uneven availability of rehabilitation services in different regions. Lack of involvement and support from family members further complicates the rehabilitation process, while patients' emotional and psychological problems can slow down or disrupt the whole rehabilitation process.

The analysis of the coordinated rehabilitation process (Fig. 2) shows that strengths outweigh weaknesses in the internal environment. In the external environment, opportunities prevail over threats. Thus, a "search" strategy emerges – optimizing the process towards eliminating the weaknesses with the lowest scores and exploiting the opportunities with the highest scores.

The proposed strategy to optimize coordinated rehabilitation is based on strengths such as well-equipped rehabilitation centers, family support, communication and cooperation with specialists, early rehabilitation, comprehensive care, and a coordinated team. These strengths will strengthen the overall process and contribute to its effectiveness.

Particular measures are needed to address the weakest points, which include staff shortages, limitations in the availability of services in the home environment, lack of education and information for patients and families, emotional and physical burden on caregivers, limited access to services, and un-systematic coordination of care. These measures should include recruiting and training new staff, improving the availability of services in the home environment, increasing the level of education of patients and their families, and introducing the role of a care coordinator to ensure effective and systematic coordination of care between members of the interprofessional team.

The best opportunities for optimizing the process of coordinated rehabilitation are not just possibilities, but potential game-changers. These include the introduction of telemedicine, technological innovation, improved information, increased collaboration between interprofessional team members, creating new specialist units, and the involvement of GPs in interprofessional teams. Another important opportunity is the prevention of cerebrovascular events, which could significantly improve the outcomes of our patients and the efficiency of our system.

Category	Item	Weight	Evaluation	Score
Strengths	Well-equipped rehabilitation centers	0.12	4	0.48
Strengths	Family support	0.12	4	0.48
Strengths	Communication and cooperation with experts	0.12	4	0.48
Strengths	Home environment	0.09	3	0.27
Strengths	Awareness	0.12	4	0.48
Strengths	Interprofessional approach	0.15	5	0.75
Strengths	Early rehabilitation	0.15	5	0.75
Strengths	Comprehensive care	0.15	5	0.75
Strengths	Coordinated by the team	0.15	5	0.75
sum		1		4.89
Weaknesses	Lack of personnel	0.14	-5	-0.70
Weaknesses	Limitations in the availability of services in the home environment	0.14	-5	-0.70
Weaknesses	Inadequate education and awareness of patients and families	0.11	-4	-0.44
Weaknesses	The emotional and physical burden of caregivers	0.11	-4	-0.44
Weaknesses	Limited access to services	0.14	-5	-0.70
Weaknesses	Unsystematic coordination of care	0.14	-5	-0.70
Weaknesses	Lack of empathetic communication by healthcare professionals	0.08	-3	-0.24
Weaknesses	Lack of rehabilitation workplaces	0.11	-4	-0.44
Weaknesses	Lack of psychological support	0.08	-3	-0.24
sum		1		-4.60
Opportunities	Telemedicine	0.12	4	0.48
Opportunities	Improving awareness	0.12	4	0.48
Opportunities	Development of home rehabilitation	0.12	4	0.48
Opportunities	Technological innovation	0.09	3	0.27
Opportunities	Increasing support for families	0.12	4	0.48
Opportunities	Greater collaboration among interprofessional team members	0.15	5	0.75
Opportunities	Creation of new specialized workplaces	0.15	5	0.75
Opportunities	Involvement of general practitioners in interprofessional teams	0.15	5	0.75
Opportunities	CVA prevention	0.15	5	0.75
sum		1		5.19
Threats	Rising healthcare costs	0.17	-4	-0.68
Threats	Demographic changes	0.13	-3	-0.39
Threats	Regional inequalities	0.17	-4	-0.68
Threats	Legislative and policy changes	0.21	-5	-1.05
Threats	Unreliable family support	0.17	-4	-0.68
Threats	Psychological unpreparedness of patients	0.17	-4	-0.68
sum		1		-4.16

Fig. 2. SWOT analysis of the coordinated rehabilitation process

Rising healthcare costs, demographic changes, regional inequalities, legislative and policy changes, unreliable family support, and patients' psychological unpreparedness are threats to coordinated rehabilitation. To mitigate these threats, strategic measures are required.

Implementing systemic measures to optimize the process of coordinated rehabilitation is recommended to

eliminate or reduce the importance of weaknesses and maximize the use of opportunities. These measures include improving and cultivating organizational culture, strengthening ward safety cultures, and ensuring effective stakeholder communication and collaboration.

The existence of coordinated rehabilitation in the Czech Republic is undoubtedly very important and topical. The original concept of coordinated

rehabilitation was designed as a strategy for community development, empowerment, and social integration of all persons with disabilities. Given the importance and relevance of coordinated rehabilitation, this initiative should be further developed to support all who need it.

The vision is to draw the attention of the professional and lay public, including legislators, to the importance of coordinated rehabilitation. It is evident that its absence in practice, due to the impossibility of financing 'coordination activities,' brings many difficulties for the various actors (clients, informal carers, professionals, and state actors). Despite efforts to ensure timeliness, comprehensiveness, and inter-professional cooperation, clients/patients' functional abilities stagnate or deteriorate after discharge from the hospital – precisely due to the lack of coordination of interventions, lack of information, and lack of cooperation between health and social service providers.

Rehabilitation after stroke is an active process that begins during acute hospitalization, continues for patients with residual disability through a systematic program of rehabilitation services, and continues after the individual returns to the community [19]. The key to minimizing disability after stroke is rehabilitation aimed at retraining patients to enhance their capacity [20]. Results of individual interviews in a study by Lewinter and Mikkelsen [21] suggest that available rehabilitation services often fall short of patients' expectations. Similar findings are supported by the results of Zwygart-Stauffacher et al. [22], who point to a lack of continuity of interventions after discharge from rehabilitation services.

One approach to achieve this is to introduce coordinated rehabilitation. CBR (community-based rehabilitation), initially aimed at increasing access to rehabilitation services in resource-limited settings, has evolved into an interprofessional approach that seeks social integration and equal opportunities for people with disabilities while combating the emergence of poverty and disability [23]. The authors state that CBR is implemented through the collaborative efforts of persons with disabilities, their families and communities, and relevant governmental and non-governmental organizations providing health, educational, vocational, social, and other services.

Expanded service provision contributes to positive patient experiences during rehabilitation and increases patient satisfaction and hope for recovery [24]. The preference for home-based therapy over visiting institutions and outpatient departments is sometimes only possible due to the availability of local rehabilitation centers, thus addressing the system's disadvantages – such as overcrowding, lack of privacy, and long waiting times [25]. The absence of rehabilitation

services may be due to a lack of awareness of these services, their inaccessibility, and other factors such as minimal family support, transport problems, difficulty in making appointments and waiting times, or lack of available health professionals; these findings are supported by the study of Mahak et al. [26].

Luker et al. [27] pointed out that although post-stroke patients understand the importance of physical activity to their recovery, they often feel frustrated by their lack of motivation and perceive boredom and little autonomy in their physical activity (both in structured therapy and leisure time. The authors' Kusec et al. [28] findings highlight that the psychological consequences of stroke are common and deserve attention in community-based stroke care. Inpatient rehabilitation does not typically address the barriers that post-stroke individuals face when returning to the community [29]. Again, the concept of coordinated rehabilitation appears effective in this regard.

The vision of coordinated rehabilitation is teamwork. All involved informants emphasized the importance of achieving an effective partnership. The experts identify the patient and their family as critical interprofessional team members, but they also wish that patients show more initiative in seeking information.

According to patient statements, the physician fulfills multiple roles, advocates for clients' best interests, educates, and provides support. Inclusion of GPs in the interprofessional team would be beneficial, but unfortunately, this is not happening (the interprofessional team functions at hospital discharge).

The lack of uniform recommendations and lack of coordination in the rehabilitation of patients after stroke or other brain injury leads to inconsistent care and different rehabilitation outcomes [30]. Mountain et al. emphasize that all members of the health care team involved in the care of stroke patients, as well as their families and caregivers, share responsibility for creating partnerships and collaborations that are key to a successful transition and return of the patient to the community [31].

To advance both stroke rehabilitation research and approaches to improving recovery after stroke, it is clear – and the findings of Ranford et al. [32] contribute to this – that an interprofessional approach is needed that encompasses all necessary components of coordinated rehabilitation.

CONCLUSION

1. A strategy to overcome the weaknesses and threats identified in the SWOT analysis of the intervention for stroke patients should include several key steps aimed at improving the current system, exploiting opportunities, and minimizing risks. Based on the analysis, the following are systemic actions

that should lead to the optimization of the coordinated rehabilitation process:

- implementation of an integrated information system: A modern information system should be introduced to manage patient information, treatment procedures, and communication between members of the interprofessional team. This system should allow quick and easy access to relevant data and patient treatment history for better care coordination;

- strengthening interprofessional collaboration: Establishing regular meetings and working groups to improve communication and collaboration between different specialists and ensure comprehensive care for patients with different needs;

- expanding home rehabilitation services: investing in developing home rehabilitation and mobile teams that could provide services in the patient's home environment. These measures could improve access to rehabilitation care for patients who cannot or do not want to visit rehabilitation centers;

- increase financial support and resources: seek additional funding to develop rehabilitation services and recruit additional professionals. This could include applying for grants, working with non-profit organizations, or negotiating with government agencies to increase funding for health care;

- patient and family education and support: This involves providing information, training, and support to patients and their families about the rehabilitation process, progress, and expected outcomes. The aim is to increase patient awareness and involvement in their treatment and to improve cooperation with healthcare providers;

- monitoring and evaluation of quality of care: introduction of regular monitoring and evaluation of the quality of rehabilitation care provided using indicators and standards set by the professional society. This will enable areas needing improvement to be identified and the success of implemented measures to be monitored.

2. These systemic measures aim to strengthen the process of coordinated rehabilitation, improve the quality of care provided, and increase the satisfaction of patients and their families. They are designed to consider identified strengths and weaknesses as well as opportunities and threats from the external environment. Their successful implementation should improve the efficiency and effectiveness of rehabilitation services.

3. Future research on coordinated rehabilitation after stroke should take into account the experiences and preferences of stroke survivors. Limitations of the current work include the relatively small number of participants and the fact that it was conducted in the inpatient rehabilitation wards of both Hospitals A

and B. However, many of the categories identified were supported by international literature, and we believe that the results may be of interest to any healthcare institution that has adopted coordinated rehabilitation as its philosophy of care.

4. The challenge in coordinated rehabilitation is to ensure adequate resources and services for patients after discharge from the hospital. Lack of rehabilitation services, especially in the home setting, and lack of care coordination are significant barriers that must be overcome. Supporting patients' families is essential to motivating and engaging them in rehabilitation activities. Educating families and providing information on available support services are essential to ensuring continuity of care and support in the home environment.

5. Lack of awareness of care and support options after hospital discharge can lead to feelings of isolation and frustration for patients and their caregivers. Therefore, developing and implementing information and education programs that provide patients and families with important information and facilitate the navigation of the health and social care system is essential.

6. Interprofessional collaboration and coordination between healthcare providers must be strengthened to ensure comprehensive and continuous follow-up and care for patients after stroke. Improved communication and collaboration within the healthcare system can contribute significantly to the efficiency of the rehabilitation process and to ensuring better patient outcomes. The challenge for the Czech Republic is to set up uniform measurement tools of functional abilities; their results could be used for a unified approach of all professionals involved - not only in the hospital but also in the home environment. In this area, it would be advisable to ensure the validity of the set long-term rehabilitation plan with the need for physiotherapy, home environment modification (occupational therapy), and provision of other services.

7. The hidden and often overlooked struggle of individuals to maintain their identity and fulfillment deserves the utmost attention from all of us.

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REFERENCES

1. ATLAS.ti: The #1 software for qualitative data analysis. ATLAS.ti Scientific Software Development GmbH [Internet]. 2024 [cited 2024 Feb 12]. Available from: <https://atlasti.com>
2. Murphy SJX, Werring DJ. Stroke: Causes and clinical features. *Medicine*. 2020 Sep;48(9):561-6. doi: <https://doi.org/10.1016/j.mpmed.2020.06.002>
3. Tadi P, Lui F. Acute stroke (cerebrovascular accident). In: StatPearls [Internet]. Treasure Island (FL): Publishing; 2024 [cited 2024 Feb 12]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK535369/>
4. Benjamin EJ, Muntner P, Alonso A, Bittencourt MS, Callaway CW, Carson AP, et al. Heart Disease and Stroke Statistics – 2019 Update: A Report From the American Heart Association. *Circulation*. 2019 Mar 5;139(10):e56-e528. doi: <https://doi.org/10.1161/CIR.0000000000000659>
5. Sacco RL, Kasner SE, Broderick JP, Caplan LR, Connors JJB, Culebras A, et al. An updated definition of stroke for the 21st century: a statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2013 May 7;44(7):2064-89. doi: <https://doi.org/10.1161/STR.0b013e318296aeca>
6. [Czech Ministry of Health. Guidelines for the Care of Patients with Acute Cerebrovascular Accident 2021]. [Internet]. Ministerstvo zdravotnictví. 2021 [cited 2024 Feb 12]. Czech. Available from: <https://www.mzcr.cz/metodicky-pokyn-pece-o-pacienty-s-akutni-cevni-mozkovou-prihodou-2021/>
7. Kalita Z. [Acute stroke: a guide for people at risk of stroke, their family members and friends]. Praha: Mladá fronta; 2010. Czech.
8. The top 10 causes of death. World Health Organization [Internet]. 2024 [cited 2024 Feb 12]. Available from: <https://www.who.int/news-room/factsheets/detail/the-top-10-causes-of-death>
9. Kendall E, Muenchberger H, Catalano T. The move towards community-based rehabilitation in industrialised countries: Are we equipped for the challenge? *Disability and Rehabilitation*. 2009 Nov 11;31(26):2164-73. doi: <https://doi.org/10.3109/09638280902939734>
10. Juckett LA, Wengerd LR, Faieta J, Griffin CE. Evidence-Based Practice Implementation in Stroke Rehabilitation: A Scoping Review of Barriers and Facilitators. *The American Journal of Occupational Therapy*. 2020 Jan 1;74(1):7401205050p1-7401205050p14. doi: <https://doi.org/10.5014/ajot.2020.035485>
11. Vacková J. [Social work in the system of coordinated rehabilitation: for clients after acquired brain injury (especially stroke) with special attention to intervention from the perspective of social work, physiotherapy, occupational therapy and other selected professions]. Praha: Grada Publishing; 2020. Czech.
12. Sarzyńska-Długosz I. An optimal model of long-term post-stroke care. *Frontiers in Neurology*. 2023 Mar 23;14:1129516. doi: <https://doi.org/10.3389/fneur.2023.1129516>
13. Martins SCO, Secchi TL, Molina C, Nogueira R. Editorial: Development of stroke systems of care across the globe. *Frontiers in Neurology*. 2023 Sep 26;14:1292036. doi: <https://doi.org/10.3389/fneur.2023.1292036>
14. Thomas E, Magilvy JK. Qualitative Rigor or Research Validity in Qualitative Research. *Journal for Specialists in Pediatric Nursing*. 2011;16(2):151-5. doi: <https://doi.org/10.1111/j.1744-6155.2011.00283.x>
15. Holloway I, Galvin KM. Qualitative research in nursing and healthcare. 4th ed. Wiley; 2017.
16. Maxwell JA. Qualitative Research Design: an Interactive Approach. 3rd ed. Vol. 41. Thousand Oaks: Sage Publications; 2013.
17. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care*. 2007 Sep 16;19(6):349-57. doi: <https://doi.org/10.1093/intqhc/mzm042>
18. Siddiqui A. SWOT Analysis (or SWOT Matrix) Tool as a Strategic Planning and Management Technique in the Health Care Industry and Its Advantages. *Bio-medical Journal of Scientific, Technical Research*. 2021 Nov 29;40(2):1-8. doi: <https://doi.org/10.26717/BJSTR.2021.40.006419>
19. Mahak C, Manisha N, Sandhya G, Dheeraj K, Dhandapani M, Dhandapani SS. Assessment of Utilization of Rehabilitation Services among Stroke Survivors. *Journal of Neurosciences in Rural Practice*. 2019 Sep 2;09(04):461-7. doi: https://doi.org/10.4103/jnrp.jnrp_25_18
20. Schwamm LH, Pancioli A, Acker JE, Goldstein LB, Zorowitz RD, Shephard TJ, et al. Recommendations for the Establishment of Stroke Systems of Care. *Stroke*. 2005;36(3):690-703. doi: <https://doi.org/10.1161/01.STR.0000158165.42884.4F>
21. Lewinter M, Mikkelsen S. Patients' experience of rehabilitation after stroke. *Disability and Rehabilitation*. 2009 Jul 28;17(1):3-9. doi: <https://doi.org/10.3109/09638289509166621>
22. Zwygart-Stauffacher M, Lindquist R, Savik K. Development of Health Care Delivery Systems That Are Sensitive to the Needs of Stroke Survivors and Their Caregivers. *Nursing Administration Quarterly*. 2000;24(3):33-42. doi: <https://doi.org/10.1097/00006216-200004000-00006>
23. Nugraha B, Defi I, Yolanda R, Warliani M, Biben V, Jennie J, et al. Describing community-based rehabilitation services in Indonesia by using The International Classification of Service Organization in Rehabilitation 2.0. *Journal of Rehabilitation Medicine*. 2021;53(3):jrm00166. doi: <https://doi.org/10.2340/16501977-2804>
24. Lamontagne ME, Richards C, Azzaria L, Rosa-Goulet M, Clément L, Pelletier F. Perspective of patients and caregivers about stroke rehabilitation: the Quebec experience. *Topics in Stroke Rehabilitation*. 2019 Jan 2;26(1):39-48. doi: <https://doi.org/10.1080/10749357.2018.1534453>
25. Abu Saydah H, Turabi R, Sackley C, Moffatt F. Stroke Survivor's Satisfaction and Experience with Rehabilitation Services: A Qualitative Systematic Review.

Journal of Clinical Medicine. 2023;12(16):5413.
doi: <https://doi.org/10.3390/jcm12165413>

26. Mahak C, Manisha N, Sandhya G, Dheeraj K, Dhandapani M, Dhandapani SS. Assessment of Utilization of Rehabilitation Services among Stroke Survivors. Journal of Neurosciences in Rural Practice. 2019 Sep 2;09(04):461-7.
doi: https://doi.org/10.4103/jnrp.jnrp_25_18

27. Luker J, Lynch E, Bernhardsson S, Bennett L, Bernhardt J. Stroke Survivors' Experiences of Physical Rehabilitation: A Systematic Review of Qualitative Studies. Archives of Physical Medicine and Rehabilitation. 2015;96(9):1698-1708.e10.
doi: <https://doi.org/10.1016/j.apmr.2015.03.017>

28. Kusec A, Milosevich E, Williams OA, Chiu EG, Watson P, Carrick C, et al. Long-term psychological outcomes following stroke: The OX-CHRONIC study. BMC Neurol. 2023 Nov 30;23(1):426.
doi: <https://doi.org/10.1186/s12883-023-03463-5>

29. Stark S, Keglovits M, Arbesman M, Lieberman D. Effect of Home Modification Interventions on the Participation of Community-Dwelling Adults With Health

Conditions: A Systematic Review. The American Journal of Occupational Therapy.

2017 Mar 1;71(2):7102290010p1-7102290010p11.
doi: <https://doi.org/10.5014/ajot.2017.018887>

30. König J, Slepíčková V. [Rehabilitation pathway of a patient after a stroke]. [Internet]. CMP Journal. 2022 [cited 2024 Feb 12];4(1):14-21. Czech. Available from: <https://www.prolekare.cz/casopisy/cmp-journal/2022-1-30/rehabilitacni-cesta-pacienta-po-prodelane-cmp-131428>

31. Mountain A, Patrice Lindsay M, Teasell R, Salbach NM, de Jong A, Foley N, et al. Canadian Stroke Best Practice Recommendations: Rehabilitation, Recovery, and Community Participation following Stroke. Part Two. International Journal of Stroke. 2020;15(7):789-806.
doi: <https://doi.org/10.1177/1747493019897847>

32. Ranford J, Asiello J, Cloutier A, Cortina K, Thorne H, Erler KS, et al. Interdisciplinary Stroke Recovery Research: The Perspective of Occupational Therapists in Acute Care. Frontiers in Neurology. 2019 Dec 17;10:1327.
doi: <https://doi.org/10.3389/fneur.2019.01327>

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