Journal of Health Development
e2663-1776

Original article

Stroke care preparedness across medical specialties: Gaps, challenges, and future directions

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Received: 05 August 2025
Revised: 18 August 2025
Accepted: 11 September 2025
Published: 30 October 2025

Citation: Rauan Kastey, Gulnara Kulkayeva, Ermek Dyussembekov, Kuanysh Nikatov, Arimantas Tamasauskas. Stroke care preparedness across medical specialties: gaps, challenges, and future directions. J Health Dev. 2025, 60 (5), jhd021. https://doi.org/10.32921/2663-1776-2025-60-5-jhd021

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Abstract

Stroke is the leading cause of death and disability worldwide, with the heaviest burden occurring in low- and middle-income countries. Effective treatment depends on timely diagnosis, prompt intervention, and well-coordinated work by medical professionals of various specialties.

The aim of this study is to evaluate stroke care preparedness across specialties and identify gaps in training, resources, and public awareness.

Methods. A qualitative study was conducted from February to June 2025 in Almaty city. Data were collected through semi-structured telephone interviews, each lasting approximately 20–30 minutes, with intensivists, neurosurgeons, neurologists, rehabilitation physicians, and emergency medical doctors.

Results. Intensivists and neurosurgeons are best prepared for stroke care, with structured training, adequate resources, and strong involvement in quality systems. Neurologists show good readiness but face resource gaps. Rehabilitation specialists and emergency medical services physicians are less prepared, with limited training and equipment. Training frequency and learning preferences vary by specialty, with most favoring online formats and peer exchange. Public awareness of stroke symptoms remains low, delaying care.

Conclusions. Clear patient pathways exist, but delays in ambulance response, diagnostics, and staffing persist. Post-hospital rehabilitation is evolving, with interest in innovative technologies like robotics and telemedicine to enhance recovery and care efficiency. Care pathways are clear, but delays in ambulance and diagnostics persist. Communication is good, though integration varies. Advancing training, public education, and tech use will boost outcomes and system efficiency.

Keywords: stroke, hospitalization, preparedness, training, Kazakhstan.

1. Introduction

Stroke is a leading cause of death and disability worldwide, with 7.8 million ischemic stroke cases reported globally in 2021. While incidence and mortality rates have declined overall, this improvement is seen mostly in high-income countries, whereas low- and middle-income countries face rising stroke burdens due to demographic and socioeconomic changes. Regional variations exist, with the Caribbean showing increased incidence and Eastern Europe, East Asia, and Sub-Saharan Africa experiencing high stroke rates. Key risk factors include metabolic disorders, pollution, smoking, and high sodium intake. The updated ICD-11 stroke definition increased ischemic stroke cases by 18.3% by including short-duration symptoms confirmed by imaging, highlighting the need for tailored, region-specific stroke management strategies [1-3].

Effective teamwork and communication are vital in acute stroke care, where timely, high-stakes decisions require coordinated efforts among multidisciplinary teams. Crisis Resource Management (CRM) principles—like situational awareness, clear roles, and communication—help address these challenges and improve team performance, especially highlighted during the COVID-19 pandemic. Telemedicine in prehospital settings depends heavily on smooth verbal and nonverbal communication, though disruptions and environmental barriers persist [4].

In stroke rehabilitation, coordinated, patient-centered teamwork involving survivors, caregivers, providers, and community supports is essential but often fragmented, causing unmet needs and disempowerment. An empowerment approach fostering collaboration and integrating social supports is key to recovery. Healthcare systems are complex networks in which the quality of teamwork plays a critical role in ensuring patient safety and improving outcomes. While evidence identifies effective teamwork strategies, gaps remain in understanding context-specific collaboration, underscoring the need for continued research and application of best practices to enhance stroke care [5-7].

Kazakhstan carries the world's highest age-standardized mortality rate for acute ischemic stroke (AIS), highlighting an urgent public health issue [8]. A multi-center survey across 79 stroke centers revealed stark regional disparities: rural areas face transport delays of 120–180 minutes and prolonged door-to-needle times, while urban centers utilizing AI and telemedicine showed faster treatment and better adherence to protocols. National registry data (2014–2019) from 177.947 stroke cases confirmed AIS as the most prevalent type, with a 5-year survival rate of 64.7%, higher than for SAH (63.1%) and ICH (57.3%). Surgical interventions showed mixed outcomes, increasing risk in AIS (HR = 2.3) and SAH (HR = 1.48) but reducing it in ICH (HR = 0.87). A separate study involving 205 informal caregivers in East Kazakhstan revealed poor communication with medical staff and high emotional burden, especially among caregivers with lower education levels [9-11].

Linked to these national challenges, the purpose of our study was to assess the preparedness of various medical specialties in managing AIS in Almaty city, focusing on gaps in training, resource availability, coordination, and perceptions of public awareness. Our findings reflect broader national trends and aim to inform strategies for reducing treatment delays, standardizing stroke protocols, strengthening caregiver support, and ultimately improving patient outcomes in both urban and underserved regions.

2. Materials and Methods

A qualitative study was conducted from February to June 2025 in Almaty city. At the outset, a letter was sent to the Health Department of Almaty, which facilitated contact with chief physicians of medical organizations. This allowed us to engage doctors from various specialties and invite them to participate in the study. Convenience sampling was employed, selecting participants based on their availability and willingness among intensivists, neurosurgeons, neurologists, rehabilitation physicians, and emergency medical doctors.

Data were collected through semi-structured telephone interviews, each lasting approximately 20–30 minutes. Interviews were manually recorded in paper form, later transcribed and uploaded into the Dedoose software for analysis. The interview guide covered topics such as stroke care preparedness, resource availability, frequency of training, and healthcare professionals' perceptions of public awareness regarding stroke symptoms. Additional themes included doctors' training preferences, experience exchange methods, and key challenges and delays in AIS care.

For data analysis, we first applied open coding by carefully reading transcripts line-by-line to identify and label discrete concepts, ideas, or categories emerging inductively from the data. This initial phase allowed codes to emerge naturally without predefined categories, with each meaningful text segment assigned one or more descriptive codes.

Following open coding, thematic coding was conducted by grouping related codes into broader themes that captured key patterns and topics across interviews. This involved comparing codes to identify connections, hierarchies, and overarching themes aligned with the study objectives, including stroke care preparedness, training practices, resource challenges, and public awareness perceptions.

This two-step coding approach enabled detailed identification of concepts and their synthesis into comprehensive themes, enhancing the depth and clarity of qualitative insights. To ensure reliability, two authors independently coded the transcripts, resolving discrepancies through discussion. Additional authors critically reviewed coding and interpretations to strengthen rigor and validity.

3. Results

Emergency medical services (EMS) and neurosurgeons have the highest average experience (17.5 and 16.2 years), suggesting more seasoned professionals. Rehabilitation specialists have the lowest (9.8 years), indicating a younger workforce. Larger groups like anesthesiologists show moderate experience, showing no direct link between group size and experience level (Table 1).

Table 1 – Number of participants and average years of experience across medical specialties

	Number of participants	**Average value of work experience**
EMS	10	17.5
Neurologist	12	11.75
Rehabilitation specialist	22	9.8
Resuscitator	32	11.2
Neurosurgeon	24	16.2

Stroke care preparedness by medical specialty

The highest readiness for managing acute stroke is shown by intensivists and neurosurgeons, with most rating their team's preparedness as "excellent" and reporting regular annual training, sufficient time, equipment, and staff. They are also actively involved in stroke registries and quality monitoring. (Participants: Intensivists – 30; Neurosurgeons – 23). Neurologists demonstrate good preparedness, with over half receiving annual training and rating their teams as "good" or "excellent," though they report more frequent limitations in resources and staffing, likely due to their outpatient roles. (Participants: Neurologists – 11). Rehabilitation specialists show varied readiness; fewer receive annual training, and many report insufficient equipment and staff. Their involvement in registries is also limited, indicating challenges in post-stroke care. (Participants: Rehabilitation physicians – 20). Emergency medical doctors appear least prepared, with no regular training reported and mostly "average" or "good" team readiness. They frequently lack equipment and staff, highlighting gaps in prehospital stroke care integration. (Participants: Emergency physicians – 10)

Training and Learning Preferences by Specialty

Emergency Medical Physicians (n=10) train mostly every 3–5 years, preferring advanced courses and peer exchange. They rarely attend international events and mainly use chats, messengers, and online conferences. Short webinars and online discussions are their preferred formats. Neurologists (n=13) train every 1–2 years, using courses, webinars, conferences, and professional communities.

Most actively participate in international events several times a year, exchanging experience via chats, webinars, and online platforms. They prefer full online courses, clinical case chats, and discussion webinars. Intensive Care Specialists (n= 25) train mostly every 1–2 years, favoring courses and scientific conferences.

About half attend international webinars regularly. They exchange experience mainly through

chats and webinars, preferring clinical case chats and short webinars.

Rehabilitation Specialists train mainly every 1–2 years, using conferences, courses, webinars, associations, and peer exchange. Most attend international events yearly or more, sharing experience through chats, webinars, and professional communities. Preferred formats include clinical chats, short webinars, full online courses, and roundtables. Neurosurgeons mostly train every 1–2 years (n=19), using conferences, courses, webinars, associations, and peer exchange.

Most participate in international events regularly, exchanging experience mainly via chats, webinars, and online conferences. Preferred formats are online conferences, clinical chats, full courses, and short webinars.

Healthcare professionals' perceptions on public knowledge and recognition of stroke symptoms

Most healthcare professionals highlight the low level of public knowledge about stroke symptoms and the lack of effective awareness campaigns. The main sources of information for patients and their relatives are TV, radio, the Internet (including social media), medical workers, and hospital educational programs. Specialists unanimously agree that this low awareness leads to delays in seeking medical help, which negatively impacts patient outcomes.

However, perceptions and assessments vary across specialties: neurologists and emergency doctors report that patients rarely recognize stroke symptoms in time, while intensive care physicians and rehabilitation specialists note more frequent and varied recognition, with knowledge levels ranging from poor to excellent. Neurosurgeons emphasize the age factor—older adults are less informed due to limited internet access, low functional literacy, and cultural characteristics. Common reasons for poor awareness include a lack of simple and accessible materials, insufficient preventive programs, and low personal responsibility for health.

To address these issues, it is essential to develop and promote diverse, accessible, and targeted awareness campaigns about stroke symptoms. Using a variety of communication channels and focusing especially on elderly and vulnerable populations is crucial. Additionally, strengthening preventive measures and enhancing healthcare professionals' training will improve the effectiveness of patient and family education (Table 2).

Table 2 – Summary of healthcare professionals' perceptions on public knowledge and recognition of stroke symptoms

Statement	**Emergency Doctors (10)**	**Neurologists (13)**	**Intensive Care Physicians (40)**	**Rehabilitation Specialists (30)**	**Neurosurgeons (26)**
Patients or relatives rarely or never recognize stroke symptoms timely	Yes (all)	Yes (mostly)	Sometimes; varied	Sometimes; varied	Sometimes or rarely
Public knowledge about stroke signs is poor to very poor	Yes (mostly)	Yes (mostly)	Varied: poor to excellent	Generally good, some poor	Mostly poor/ very poor
Awareness campaigns are lacking or ineffective	Lack noted (most)	Many report no effective	Often lacking or ineffective	Frequently absent/ineffective	Frequently absent
Main sources influencing patient knowledge: TV/radio, Internet/social media, medical workers	TV/radio, Internet, medical workers, hospital programs	Internet/ social media, medical workers	TV/radio, Internet, medical workers, hospital programs	Internet, TV/radio, medical workers, educational programs	Internet, TV/radio, hospital programs

Continuation of Table 2

Low awareness contributes significantly to delays in seeking help	Strong agreement	Strong agreement	Mostly agree	Most agree	Strong agreement
Reasons for low awareness include: lack of personal responsibility, poor information, mentality, low literacy, and insufficient campaigns	Personal responsibility, mentality	Few billboards, poor access, disinterest	Mentality, lack of info, internet gaps	Lack of training, low education, staff variability	Elderly population, mentality, low literacy, poor social media

Overview of stroke care processes and challenges according to medical professionals

The findings highlight those intensivists and neurosurgeon are the most prepared to manage AIS, with structured training, resource availability, and active participation in quality systems. Rehabilitation specialists and particularly EMS physicians lag behind, suggesting the need for systemic improvements to better support their roles within the multidisciplinary stroke care continuum (Table 3).

Table 3 – Overview of stroke care processes and challenges according to medical professionals

Aspect	Emergency Doctors	Neurologists	Intensive Care Specialists	Rehabilitation Specialists	Neurosurgeons
Clear patient pathways	Mostly clear (2 participants)	Confirmed (6 participants)	Confirmed (7 participants)	Mostly yes (18 full, 7 partial)	Mostly yes (~25 full)
Official agreements	Present (3 participants)	Present (5 participants)	Present (7 participants)	Mostly present (~17)	Present or in development (~20)
Communication quality	Good to excellent (3 participants)	Good (5 participants)	Good to excellent (7 participants)	Mostly good or satisfactory (~20)	Good to excellent (>20 participants)
Training/ simulations frequency	Rare (1 participant)	Irregular, ~quarterly (4 participants)	More frequent (6 participants)	Irregular, annual or quarterly	Regular, quarterly or monthly
Main causes of delays	Ambulance call & arrival time (4), equipment/personnel shortage (3)	Ambulance call, arrival, diagnostics (7)	Late ambulance call, diagnostics (7)	Ambulance call, imaging delays, staff/equipment shortage	Ambulance call, diagnostics, stroke center access, staffing
Focus on treatment improvements	-	Diagnostics & rehabilitation (6)	Modern treatments (thrombectomy, telemedicine) (5)	-	Advanced diagnostics, thrombectomy, telemedicine
Post-hospital rehabilitation	Underdeveloped (3 participants)	-	Development noted (6 participants)	Mostly comprehensive but some gaps (~20)	Supported but still developing
Interest in new technologies	-	-	-	Robotics, VR therapy, telemedicine	Robotics, VR therapy, telemedicine, advanced diagnostics

Emergency doctors report that stroke patient pathways and official priority transport agreements are mostly clear (n=2-3). Communication with stroke units is good to excellent (n=3), but regular training is rare (1 participant). Main delays are due to ambulance call and arrival times (n=4), plus shortages of equipment and staff (n=3). Post-hospital rehabilitation is underdeveloped (n=3).

Neurologists confirm clear patient pathways (n=6) and agreements with emergency services (n=5). Communication is good (n=5), but training is irregular (n=4). Delays stem from ambulance calls, arrival, and diagnostics (n=7). They emphasize monitoring treatment outcomes and improving diagnostics and rehabilitation (n=5-6). Intensive care specialists report clear pathways and agreements (n=7), good to excellent communication (n=7), and more frequent training (6 participants). Delays relate to late ambulance calls and diagnostics (n=7). They actively use modern treatments like thrombectomy and telemedicine (n=5) and note progress in rehabilitation and patient monitoring (n=6).

Rehabilitation specialists mostly confirm clear pathways (n=18 fully, n= 7 partially) and official agreements (n= 17). Communication is mostly good or satisfactory (n=20), but training is irregular, often annual or quarterly. Delays include ambulance call timing, imaging delays, and staff/equipment shortages.

Neurosurgeons agree on clear pathways (n=25 fully) and official agreements (n=20). Communication is good to excellent (20+), with regular quarterly or monthly training. Delays involve ambulance call, diagnostics, access to stroke centers, and staffing. They stress the need for advanced diagnostics and treatments like CT/MRI perfusion, thrombectomy, and telemedicine.

Regarding post-hospital rehabilitation and secondary prevention, rehabilitation specialists report mostly comprehensive programs, though some gaps remain. Neurosurgeons generally support this but note ongoing development in some institutions. Both groups show interest in new technologies—robotics, VR therapy, telemedicine, and advanced diagnostics—to improve care and reduce delays.

4. Discussion

We found that intensivists and neurosurgeons have the highest experience levels, reflecting seasoned professionals, while rehabilitation specialists and EMS physicians appear less prepared, highlighting systemic gaps in post-stroke care and prehospital management. Similarly, physician awareness of stroke varies significantly across regions and specialties. For example, in northwest China, only about 40% of primary healthcare providers were aware of the critical time window for acute ischemic stroke treatment, with better knowledge linked to more frequent training [12]. In contrast, emergency department staff in Cyprus demonstrated moderate stroke knowledge, with physicians scoring higher than nurses but still showing gaps, particularly in recognizing stroke severity scales such as the National Institutes of Health Stroke Scale [13]. Studies from other countries reveal varied knowledge levels among healthcare professionals, underscoring an overall suboptimal stroke awareness globally. These findings emphasize the urgent need for targeted and repeated education and training to improve early stroke recognition and management across all healthcare providers [14-17].

In our study, the interest in advanced diagnostics such as computed tomography and magnetic resonance imaging (CT/MRI) perfusion, telemedicine, thrombectomy, robotics, and virtual reality (VR) therapy reflects a readiness among physicians to adopt innovations that could improve stroke outcomes and efficiency. Physicians also discussed potential barriers and facilitators to integrating these technologies, including training, costs, and infrastructure. Current research highlights that while mechanical thrombectomy has revolutionized stroke care, reducing time from symptom onset to reperfusion remains a primary goal, with technology offering significant promise in prehospital detection, evaluation, triage, and transport, though most prehospital technologies are still in early development stages [18].

Robotics and VR have been extensively studied in stroke rehabilitation, showing some success in enhancing recovery through intensive, engaging therapies, but more high-quality trials are needed to clarify their role in precision stroke recovery. Additionally, the implementation of acute stroke telemedicine programs reveals that sustained use requires addressing evolving barriers such as infrequent use and resistance to treatment, while facilitators include hospital system changes and clinician benefits; individual attitudes and organizational support remain critical [19,20]. Digital health innovations have contributed to advances in stroke prevention, acute treatment, and rehabilitation globally, including wearable devices and automatic diagnostics, yet their widespread adoption is limited

by insufficient evidence and implementation challenges, as seen in countries like Japan [21]. Overall, thoughtfully applied technology holds transformative potential across the stroke care continuum but demands ongoing training, infrastructure investment, and tailored strategies to ensure sustainable integration and improved patient outcomes.

We found that low public awareness of stroke symptoms is a major barrier to timely care, as confirmed by all specialties. The varying perceptions across specialties regarding patient knowledge suggest the need for targeted awareness campaigns, particularly focused on vulnerable groups such as older adults. Previous research highlights the critical role of communities in enhancing stroke preparedness by engaging high-risk populations through culturally tailored, peer-led interventions. These efforts improve recognition of stroke symptoms and encourage prompt activation of emergency medical services, which are essential to reducing prehospital delays and increasing timely access to acute stroke treatments [22-24].

Our findings underscore the urgent need for systemic improvements to better support EMS and rehabilitation roles within stroke care. Strengthening continuous training programs tailored specifically to these specialties is essential to address existing knowledge gaps and enhance the quality of prehospital and post-stroke management. Additionally, enhancing public education and awareness campaigns is critical to improve early stroke recognition and encourage timely hospital presentation, which are key factors in optimizing treatment outcomes. Promoting multidisciplinary collaboration among healthcare providers and implementing quality monitoring through stroke registries can further drive improvements in care coordination and patient outcomes.

This study's qualitative approach provided valuable, in-depth insights across multiple specialties, capturing diverse perspectives on stroke care challenges and opportunities. However, certain limitations should be acknowledged. The relatively small sample size and reliance on self-reported data may introduce bias, while the regional focus on Almaty limits the generalizability of the findings to other settings. Despite these limitations, the study offers important groundwork for designing targeted interventions and highlights areas for future research to strengthen stroke care systems.

5. Conclusions

Intensivists and neurosurgeons are best prepared for stroke care, while neurologists face some resource limits. EMS and rehab specialists lag due to irregular training and equipment shortages. Low public awareness still causes treatment delays. Clear care pathways exist, but ambulance and diagnostic delays are common. Communication is generally good, but integration varies. There is a growing interest in advanced diagnostics, telemedicine, and rehabilitation technologies. Future efforts must focus on strengthening training, public education, and cross-specialty coordination. Addressing these gaps will improve stroke outcomes and system efficiency.

Conflict of interest. The authors declare no conflicts of interest.

Authors contributions. All authors equally participated in the study and writing of this article.

Funding. No external funding was provided for this study.

Publication information: This article has not been previously published and has not been considered by any other publication.

References

1. Prust, M. L., Forman, R., & Ovbiagele, B. (2024). Addressing disparities in the global epidemiology of stroke. Nature reviews. Neurology, 20(4), 207–221. https://doi.org/10.1038/s41582-023-00921-z

2. Hou, S., Zhang, Y., Xia, Y., Liu, Y., Deng, X., Wang, W., Wang, Y., Wang, C., & Wang, G. (2024). Global, regional, and national epidemiology of ischemic stroke from 1990 to 2021. European journal of neurology, 31(12), e16481. https://doi.org/10.1111/ene.16481

3. Dirren, E., Escribano Paredes, J. B., Klug, J., Barthoulot, M., Fluss, J., Fracasso, T., Kurian, G. K., Machi, P., Niederhauser, J., Suppan, L., Sztajzel, R. F., Bijlenga, P., & Carrera, E. (2025). Stroke Incidence, Case Fatality, and Mortality Using the WHO International Classification of Diseases 11: The Geneva Stroke Study. Neurology, 104(5), e213353. https://doi.org/10.1212/WNL.0000000000213353

4. Rajendram, P., Notario, L., Reid, C., Wira, C. R., Suarez, J. I., Weingart, S. D., & Khosravani, H. (2020). Crisis Resource Management and High-Performing Teams in Hyperacute Stroke Care. Neurocritical care, 33(2), 338–346. https://doi.org/10.1007/s12028-020-01057-4

5. Joseph, A., Chalil Madathil, K., Jafarifiroozabadi, R., Rogers, H., Mihandoust, S., Khasawneh, A., McNeese, N., Holmstedt, C., & McElligott, J. T. (2022). Communication and Teamwork During Telemedicine-Enabled Stroke Care in an Ambulance. Human factors, 64(1), 21–41. https://doi.org/10.1177/0018720821995687

6. Hartford, W., Lear, S., & Nimmon, L. (2019). Stroke survivors' experiences of team support along their recovery continuum. BMC health services research, 19(1), 723. https://doi.org/10.1186/s12913-019-4533-z

7. Rosen, M. A., DiazGranados, D., Dietz, A. S., Benishek, L. E., Thompson, D., Pronovost, P. J., & Weaver, S. J. (2018). Teamwork in healthcare: Key discoveries enabling safer, high-quality care. The American psychologist, 73(4), 433–450. https://doi.org/10.1037/amp0000298

8. Kastey, R., Turganova, M., Akhmetzhan, A., Faizullina, K., & Vaičiulis, V. (2024). Study of hospitalized cases associated with acute cerebrovascular accidents. Journal of Health Development, 3(57), 22-27. https://doi.org/10.34689/SH.2024.27.1.006

9. Kairatova, G. K., Khismetova, Z. A., Smailova, D. S., Serikova-Esengeldina, D. S., Berikuly, D., Akhmetova, K. M., & Shalgumbayeva, G. M. (2024). Assessment of Skills of Caregivers Providing Care for Stroke Patients in East Kazakhstan Region. Healthcare (Basel, Switzerland), 13(1), 27. https://doi.org/10.3390/healthcare13010027

10. Makhanbetkhan, S., Turdaliyeva, B., Sarshayev, M., Adilbekov, Y., Medukhanova, S., Davletov, D., Maidan, A., & Berdikhojayev, M. (2025). Improving Acute Ischemic Stroke Care in Kazakhstan: Cross-Sectional Survey. Journal of clinical medicine, 14(7), 2336. https://doi.org/10.3390/jcm14072336

11. Zhakhina, G., Zhalmagambetov, B., Gusmanov, A., Sakko, Y., Yerdessov, S., Matmusaeva, E., Imanova, A., Crape, B., Sarria-Santamera, A., & Gaipov, A. (2022). Incidence and mortality rates of strokes in Kazakhstan in 2014-2019. Scientific reports, 12(1), 16041. https://doi.org/10.1038/s41598-022-20302-8

12. Ding, G. B., Sang, Q., Han, H. J., Wang, X. M., & Wu, Y. F. (2023). Assessment of stroke knowledge and awareness among primary healthcare providers: A cross-sectional survey from the Kezhou quality improvement in acute stroke care project. Frontiers in public health, 11, 1136170. https://doi.org/10.3389/fpubh.2023.1136170

13. Rossis, C., Michail, K. A., Middleton, N., Karanikola, M., Papathanassoglou, E., & Mpouzika, M. (2023). Knowledge on Stroke Recognition and Management among Emergency Department Healthcare Professionals in the Republic of Cyprus. Healthcare (Basel, Switzerland), 12(1), 77. https://doi.org/10.3390/healthcare12010077

14. Albart, S. A., Yusof Khan, A. H. K., Abdul Rashid, A., Wan Zaidi, W. A., Bidin, M. Z., Looi, I., & Hoo, F. K. (2022). Knowledge of acute stroke management and the predictors among Malaysian healthcare professionals. PeerJ, 10, e13310. https://doi.org/10.7717/peerj.13310

15. Baby, P., Srijithesh, P. R., Ashraf, J., & Kannan, D. (2019). Emergency nurses' knowledge about tissue plasminogen activator therapy and their perception about barriers for thrombolysis in acute stroke care. International Journal of Noncommunicable Diseases, 4(4), 121-126. https://doi.org/10.4103/jncd.jncd_16_19

16. Krzystanek, E., Krzak-Kubica, A., Świat, M., Galus, W., & Gawryluk, J. (2020). Adequate Knowledge of Stroke Symptoms, Risk Factors, and Necessary Actions in the General Population of Southern Poland. Brain sciences, 10(12), 1009. https://doi.org/10.3390/brainsci10121009

17. Shire, F., Kasim, Z., Alrukn, S., & Khan, M. (2017). Stroke awareness among Dubai emergency medical service staff and impact of an educational intervention. BMC research notes, 10(1), 255. https://doi.org/10.1186/s13104-017-2585-x

18. Martinez-Gutierrez, J. C., Chandra, R. V., Hirsch, J. A., & Leslie-Mazwi, T. (2019). Technological innovation for prehospital stroke triage: ripe for disruption. Journal of neurointerventional surgery, 11(11), 1085–1090. https://doi.org/10.1136/neurintsurg-2019-014902

19. Rajashekar, D., Boyer, A., Larkin-Kaiser, K. A., & Dukelow, S. P. (2024). Technological Advances in Stroke Rehabilitation: Robotics and Virtual Reality. Physical medicine and rehabilitation clinics of North America, 35(2), 383–398. https://doi.org/10.1016/j.pmr.2023.06.026

20. Bagot, K. L., Moloczij, N., Barclay-Moss, K., Vu, M., Bladin, C. F., & Cadilhac, D. A. (2020). Sustainable implementation of innovative, technology-based health care practices: A qualitative case study from stroke telemedicine. Journal of telemedicine and telecare, 26(1-2), 79–91. https://doi.org/10.1177/1357633X18792380

21. Wada, S., Okada, T., Koga, M., & Mizuno, A. (2025). Current Status and Future Aspect of Digital Health Innovation in Stroke Prevention and Management. Journal of atherosclerosis and thrombosis, 32(7), 775–782. https://doi.org/10.5551/jat.RV22036

22. Kelly, K. M., Holt, K. T., Neshewat, G. M., & Skolarus, L. E. (2017). Community Interventions to Increase Stroke Preparedness and Acute Stroke Treatment Rates. Current atherosclerosis reports, 19(12), 64. https://doi.org/10.1007/s11883-017-0695-5

23. Prabhakaran, S., Richards, C. T., Kwon, S., Wymore, E., Song, S., Eisenstein, A., Brown, J., Kandula, N. R., Mason, M., Beckstrom, H., Washington, K. V., & Aggarwal, N. T. (2020). A Community-Engaged Stroke Preparedness Intervention in Chicago. Journal of the American Heart Association, 9(18), e016344. https://doi.org/10.1161/JAHA.120.016344

24. Skolarus, L. E., Zimmerman, M. A., Bailey, S., Dome, M., Murphy, J. B., Kobrossi, C., Dombrowski, S. U., Burke, J. F., & Morgenstern, L. B. (2016). Stroke Ready Intervention: Community Engagement to Decrease Prehospital Delay. Journal of the American Heart Association, 5(5), e003331. https://doi.org/10.1161/JAHA.116.003331

Әртүрлі медициналық мамандықтар арасында инсульт кезінде көмек көрсетуге дайындық: Мәселелер, жетіспеушіліктер және перспективалар

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Түйіндеме

Инсульт бүкіл әлемде өлім-жітім мен мүгедектіктің негізгі себебі болып табылады, ең үлкен ауыртпалық табысы төмен және орташа елдерде байқалады. Тиімді емдеу уақтылы диагностикаға, жедел араласуға және әртүрлі мамандықтағы медицина қызметкерлерінің үйлесімді жұмысына байланысты.

Зерттеудің мақсаты: әртүрлі медициналық мамандықтар арасында инсульт кезінде медициналық көмек көрсетуге дайындығын бағалау және оқыту, ресурстар мен халықтың хабардар болуындағы олқылықтарды анықтау.

Әдістері. Сапалы зерттеу 2025 жылдың ақпан-маусым айлары аралығында Алматы қаласында жүргізілді. Деректер реаниматологтар, нейрохирургтар, неврологтар, реабилитологтар және жедел жәрдем дәрігерлерінің қатысуымен шамамен 20-30 минутқа созылатын жартылай құрылымды телефон сұхбаттары арқылы жиналды.

Нәтижесі. Реаниматологтар мен нейрохирургтер кеңес беру кезінде көмек көрсетуге дайын: оларда оқыту жүйесі реттелген, ресурстары жеткілікті және орта деңгейдегі белсенділік байқалады. Неврологтар жоғары дайындық танытқанымен, ресурс тапшылығына жиі тап болады. Реабилитологтар мен жедел жәрдем дәрігерлері жеткілікті деңгейде дайын емес: оқыту жүйесіз, жабдықтар мен кадрлар жиі жағдайда жетіспейді. Оқыту жиілігі мен оқыту форматына деген ұстанымдар мамандықтар бойынша ерекшеленеді, көпшілігі онлайн-форматтар мен тәжірибе алмасуды таңдайды. Халықтың инсульт белгілері жөніндегі хабардарлығы төмен болып қалып отыр, бұл алғашқы көмектің кешігуіне әкеледі. Реабилитация саласындағы мамандар жаңа технологияларға – робототерапияға, телемедицинаға және виртуалды шындыққа ерекше қызығушылық білдіруде.

Қорытынды. Инсульт кезінде көмек көрсету маршруттары жалпы түсінікті, алайда жедел жәрдем шақыру мен диагностикада кідірістер сақталуда. Қызметтер арасындағы байланыс жақсы, бірақ интеграция әр түрлі. Мамандарды даярлауды, халықты ағартуды күшейту және технологияларды енгізу нәтижелерді жақсартады және жүйенің тиімділігін арттырады.

Түйін сөздер: инсульт, ауруханаға жатқызу, дайындық, оқыту; Қазақстан.

Готовность к оказанию помощи при инсульте среди различных медицинских специальностей: Пробелы, вызовы и перспективы развития

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Резюме

Инсульт является основной причиной смертности и инвалидности во всем мире, причем наиболее тяжелое бремя наблюдается в странах с низким и средним уровнем дохода. Эффективное лечение зависит от своевременной диагностики, быстрого вмешательства и слаженной работы медицинских работников различных специальностей.

Цель исследования: оценить готовность различных медицинских специальностей к оказанию помощи при инсульте, а также выявить пробелы в обучении, ресурсах и информированности населения.

Методы. Качественное исследование проводилось с февраля по июнь 2025 года в городе Алматы. Данные собирались с помощью полуструктурированных телефонных интервью продолжительностью примерно 20–30 минут с участием специалистов: реаниматологов, нейрохирургов, неврологов, реабилитологов и врачей скорой медицинской помощи.

Результаты. Реаниматологи и нейрохирурги демонстрируют наибольшую готовность: у них налажено обучение, достаточно ресурсов и отмечается активное участие на среднем уровне. Неврологи также показывают высокий уровень подготовки, однако сталкиваются с нехваткой ресурсов Частота и форматы обучения варьируют по специальностям; большинство участников предпочитает онлайн-курсы и обмен опытом. Осведомленность населения о симптомах инсультов остается низкой, что приводит к задержкам оказания помощи. Реабилитационные специалисты проявляют интерес к внедрению новых технологий (робототерапия, телемедицина, виртуальная реальность) для повышения эффективности восстановления.

Выводы. Маршруты оказания помощи при инсульте в целом понятны, но сохраняются задержки с вызовом скорой помощи и диагностики. Взаимодействие между службами налажено, однако уровень интеграции различается. Усиление подготовки медицинских специалистов, повышение информированности населения и внедрение инновационных технологий способны улучшить результаты лечения и повысить эффективность системы помощи при инсульте.

Ключевые слова: инсульт, госпитализация, готовность, обучение, Казахстан.